

Biological Survey: Need & Network

Report of a Working Party
set up by the Linnean Society of London

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Introduction

THIS DOCUMENT is the result of concern about the state and lack of co-ordination of biological recording in the British Isles, expressed at two open meetings (at Leicester, 13-14 September 1984, organized by the Biological Curators' Group, and a follow-up in London, 7-18 April 1985) which led to the formation of a National Federation for Biological Recording and a request to the Linnean Society for a comprehensive review of biological recording (Appendix I). The Linnean Society set up a Working Party (see Appendix II) to inquire into the subject and make recommendations to the Council of the Society. The Working Party met on eight occasions, and its Report is attached herewith.

R.J. BERRY
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1. Nature and Aims of Biological Survey

1.1 BIOLOGICAL SURVEYS OF MANY TYPES are carried out in the UK. Most are undertaken for specific purposes, for example:

- i. *Strategic*: i.e. use by others than the recorders, for conservation management or surveillance (including work by the conservation trusts and local natural history societies, by the Nature Conservancy Council in pursuit of its statutory responsibilities such as the identification of sites of special scientific interest), for planning (including land-use and environmental impact assessments), for water quality monitoring and for assessment of pest status.
- ii. *Scientific (or fundamental)*: identification of trends (including extinctions), fluctuations and successions in both individual species and communities. In addition to work in universities, research establishments and so on, this includes national censuses organized by scientific societies, mostly coordinated by the national Biological Records Centre (BRC) at Monks Wood (the most important exception being the ornithological data collected under the auspices of the British Trust for Ornithology). Also local surveys organized by conservation trusts or local natural history societies: some of these data may be sent to the BRC, but most are held in local or regional records centres (Appendix III).
- iii. *'Aesthetic' reasons*, that is recording for its own sake. This is a motive (and potential resource) which should not be ignored. The strength of its influence is demonstrated by the hundreds of 'twitchers' who will travel long distances to record a rare bird, or the large numbers of members that natural history societies often attract to field meetings (Berry, 1988).
- iv. *Education*: where a species or community is to be found when it is wanted for project work, class observation, etc.

1.2 Biological surveys result in the production of records. A biological record should incorporate four elements: a *species* or *habitat* identified by a person at a *location* at some point in *time*. The value of a record is likely to be enhanced by the inclusion of additional detail, such as age or density, or environmental (eg. climatic or edaphic) or historical information. Notwithstanding, historical species records lacking some of the basic information (for example, date and/or site) may still be useful.

- i. All four elements require validation. The commonest source of error is probable in taxonomic identification. The recorder may not be a competent taxonomist, and his/her identification may require confirmation by an expert or by comparison with a voucher specimen. The responsibility for accepting the validity of a record must lie with the person who stores the primary data (or an agent appointed by that person).

- ii. There is no distinction in principle between 'species' and 'site' recording; any apparent differences arise through the way(s) in which the basic records are used. However, in practice, data tend to be stored and retrieved in such a way as to produce a separation between 'species' and 'site' information.

1.3 The usefulness of biological records is not confined to the collectors of the data, nor to the purpose for which they were originally collected. To maximize the availability of data to all who might want them a number of 'biological record centres' act as clearing houses for data, each centre covering a particular county or region. The centres collect, collate and store biological records together with any preserved, printed or manuscript materials supporting them, from whatever source. They must be responsible for controlling the quality of the data collected, and they may also have the function of co-ordinating those making the observations in time, space and methodology so that the data collected are scientifically meaningful. In particular, they have a vital role to play in implementing, wherever practical, standard methodologies designed either for data-gathering, storage or dissemination, and which have been approved by an appropriate authority (e.g. the national Biological Records Centre or one of the learned societies). In carrying this out they will be contributing very significantly to the evolution of an integrated biological recording scheme.

1.4 Data collated in this way can be used for:

- i. Preparation of local and national floras and faunas as guides to the biological diversity of an area or county including, wherever possible, the habitats in which the species occur, and associated species.
- ii. Preparation of local and national distribution maps and their publication as atlases as a basis for biogeographical analysis.
- iii. Identification and assessment of sites containing habitats of interest, for integration into strategic planning, for SSSI or other designation, or for purchase and/or management as protected areas.
- iv. The identification and assessment of the status of rare or threatened taxa as the basis for determining conservation priorities locally, nationally and internationally. This information can be disseminated, with accompanying proposals, to those individuals, organizations and government departments in a position to make best use of it.
- v. Monitoring changes in the distribution or population sizes of taxa or degradation of habitat to give early warning: (a) of threats to particular taxa or groups of taxa; (b) of threats to particular habitats.
- vi. Plotting migration of mobile taxa such as birds and insects.
- vii. Supporting taxonomic expertise.
- viii. Providing information on the exact location of material exhibiting taxonomic diversity as a basis for chemical, genetic or autecological research.
- ix. Providing information for historical and other research.
- x. Formulating advice to Government on taxa to be included in the Schedules to the Wildlife and Countryside Act 1981, the Berne Convention and other legislation.

2. History of Biological Recording

2.1 A BRIEF LOOK AT THE HISTORICAL DEVELOPMENT of biological recording in Britain helps to understand the organizations and activities that exist today. The importance of a biological inventory has been recognised at least since the time of John Ray who wrote in 1660: "I design to put forward a compleat Phytologia Britannica". Since then amateur natural historians have contributed greatly to the knowledge of our flora and fauna (Allen, 1976).

2.2 However the first significant attempt at coordinating recording was the formation of a Central Committee for the Study of British Vegetation in 1904; this led directly to the establishment of the British Ecological Society in 1913. The Vegetation Committee was proposed by Tansley (1902) on the grounds that :

"Co-operation is necessary if any considerable results are to be obtained. It is much to be desired that the surveying part of the work should be taken up by active members of local natural history societies."

He emphasised the potential:

"Scattered up and down the country are scores of men whose hobby is botany and whose acquaintance with their local floras is absolutely unequalled. Too often they carry with them to their graves knowledge which would be of the greatest value in helping to build up a picture of the vegetation of the country as a whole. Convince them of the interest of ecological survey work, and you would secure their co-operation in working out and mapping local floras from that point of view, which with the requisite general knowledge of methods and a certain amount of help and direction, they would do a hundred times better than a visiting botanist, with no knowledge of the locality." (Tansley, 1904).

This remark is highly pertinent at the present time, because the under-utilization of the expertise of amateurs (largely due to the professionalisation of biology; Berry, 1983), has resulted in much survey work being done by Manpower Service Scheme teams and others on short-term contracts, with very variable results.

2.3 In 1947 the British Association Conference of Delegates of Corresponding Societies considered a proposal to produce "basic maps for the plotting, classification and correlation of natural history records". No action was taken because "maps of this type were being constructed for certain areas by the Council for the Promotion of Field Studies, and it was thought that the time was hardly appropriate for the Conference to take action until more evidence of the kind of map required was available."

In 1950 the Botanical Society of the British Isles set up a committee to map the

British flora which led to the launching of the Distribution Maps Scheme in 1954, with funding from the Nature Conservancy, and the publication of the *Atlas of the British Flora* in 1962 (see Allen, 1986: 153-58).

Despite this initiative, the indecision of the BA Conference has been repeated on many occasions. In the Foreword to the BTO *Atlas of Breeding Birds in Britain and Ireland* (1976), Ferguson-Lees recorded that

"For over two years, the possibility of an Atlas of Breeding Birds was discussed regularly There was a seemingly irreconcilable division of opinion between the optimists and enthusiasts on the one hand, and the pessimists and diffidents on the other, the latter believing that such a project was doomed to failure through inadequate coverage. Even the optimists said that, because of the uneven spread of observers, and their scarcity or absence in remoter areas, the best coverage that could be expected was 90% in England, 50% in Wales and a mere 25% in Scotland How wrong we all were."

Some ornithologists also considered that the whole concept lacked sufficient scientific merit to justify it being undertaken at all, but in this direction the majority were agreed in regarding it as a potentially invaluable tool for conservation and of considerable importance as a permanent record, for future comparison of bird distributions at a time of great environmental change.

2.4 In 1964 the data and mapping machinery used in the preparation of the *Botanical Atlas* were transferred to Monks Wood in Huntingdonshire and formed the nucleus of the Biological Records Centre (BRC).¹ Its objectives were to set up and operate a computerised data bank of information on the occurrence of plants and animals in the British Isles; to maintain an archive of the original records from which the data bank was compiled; and to make these data available in a variety of forms, for research, monitoring, nature conservation, education and general information.

The main emphasis in the work of the BRC has been the co-ordination of over 60 national Biological Recording Schemes organised by national societies, formal study groups and individuals, to make surveys of particular groups of plants and animals. BRC's role has been to help establish the recording schemes, to provide record cards, to process and check the records and store them in the BRC data bank and archive, and to assist with the publication of the results. Mapping is carried out on a ten kilometre square basis. A series of atlases has been published, often in co-operation with national societies (Harding, 1985).

2.5 There have been many attempts to establish biological recording on a firmer footing (Greenwood, 1971). In the 1970s the then director of BRC, Dr Frank Perring encouraged the setting up of local record centres and attempted to establish a network of local centres which would be co-ordinated by BRC. In 1973

¹ At that time part of the Nature Conservancy but now under the Institute of Terrestrial Ecology of NERC, with financial support by contract from the NCC.

2. History of Biological Recording

BRC and the Department of Museum Studies of the University of Leicester organised the Leicester Conference on Environmental Record Centres which provided the opportunity for museums and other organisations to review progress in environmental recording, to exchange experience and to learn more about the requirements of the user community, particularly planners and conservationists. In arranging the conference on the eve of the reorganisation of Local Government, it was hoped that it might be possible to persuade the new local authorities to accept responsibility for biological recording during reorganization. To this end the conference passed a resolution that

"Environmental Record Centres should be set up and paid for by Local Authorities to cover areas based upon the existing Vice County system. They should have the same status as County Record Offices and they should be associated with them."

Although two new centres were set up, only one (West Yorkshire) succeeded in obtaining additional finance and resources for this purpose (Lavin and Wilmore, 1977). In 1977 a meeting of record centre organisers took place at Monks Wood and in 1978 a *Handbook for Local Biological Record Centres* (Flood and Perring, 1978) was published. Overall, therefore, the conference failed in its objective.

There were parallel moves in Scotland. A conference in Dundee in 1975 led to the ongoing Biological Recording in Scotland Committee, which produces newsletters and co-ordinates recording schemes in Scotland (Somerville, 1977).

2.6 Subsequently, many local Nature Conservation Trusts with the support of the Nature Conservancy Council, World Wildlife Fund, and BP, acquired computers and began to computerise data relating to their reserves and sites of natural history interest. Many national societies embarked on new and expanded recording schemes and co-ordination between the various schemes soon became a major problem. Much of the initiative as far as local biological record centres were concerned was taken by museums and in particular by the Biology Curators' Group (BCG) in co-operation with the BRC. In 1980 BCG and BRC carried out a survey of local record centres (Harding and Greenwood, 1981; Greenwood and Harding, 1982). A new initiative in 1984 followed the recognition of the tremendous growth in resources being devoted to biological recording, due mainly to the availability of labour under the Government sponsored Manpower Services Commission.

2.7 The 1984 BCG Seminar *Biological Recording and the Use of Site Based Biological Information* (1985) confirmed the widely held view that "the present situation both nationally and locally for biological recording, storage and retrieval of data was unsatisfactory" and it drew attention to the problems arising from lack of finance, of central co-ordination and of standards. The seminar led directly to the setting up of an *ad hoc* group, initiated by BRC and drawn from the Biology Curators' Group and other interested organisations, to find means of improving the situation. The group organized a *Biological Recording Forum* at Chelsea