NATIONAL FEDERATION FOR BIOLOGICAL RECORDING

BOTANICAL RECORDING AND CONSERVATION

Proceedings of the annual conference of the National Federation for Biological Recording held jointly with the Botanical Society of the British Isles

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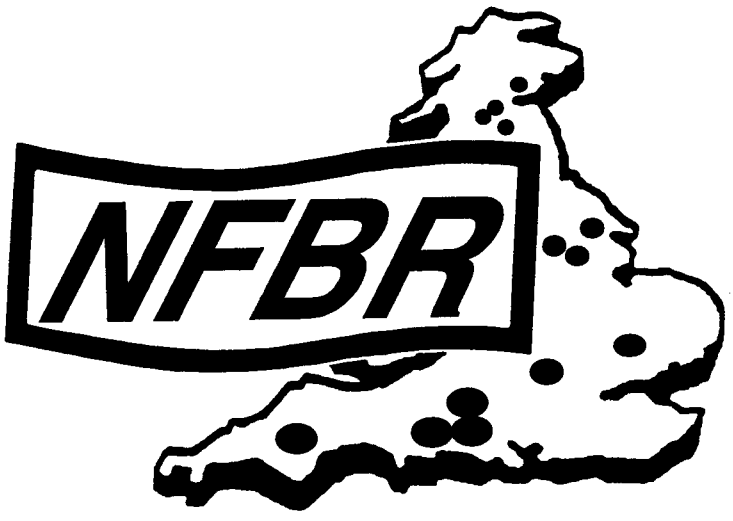

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THE BSBI ATLAS 2000 PROJECT
Re-surveying the UK Flora

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Atlas 2000 Organiser

History

In 1836, Hewett Cottrell Watson envisaged the preparation of a series of distribution maps. In an article on map construction, he wrote "To represent the distribution of individual forms or species let us first imagine a geographical map of such dimensions as would render it possible to mark every locality for any given species, by some sign, or spot of colour ...This would give an exact picture of topographical distribution; but as it would require to be made on the scale of at least a yard to the mile, it is obviously out of the question. With less precision ...we might greatly reduce the scale by indicating all localities within certain distances of each other as single ones."

He divided Britain into smaller and smaller units, culminating in the delimitation of the British Vice-counties, and mapped the distribution of 39 species in *The Geographical Distribution of British Plants* (1843) according to these areas.

The focus then shifted to Europe for the next 60 or 70 years, where Hermann Hoffmann developed mapping, and pioneered the use of dot maps and mapping on a grid basis. It was not until 1902 that interest was re-kindled closer to home, when Praeger began mapping the Irish flora and then, in 1917, the whole of the British Isles. The first published dot-map of a British plant, however, was by Good in 1936, when he mapped the Lizard Orchid, *Himantoglossum hircinum.*

In 1950, Prof. A.R. Clapham suggested that the BSBI should undertake the preparation of a set of distributional dot-maps of British species. The "Maps Scheme" was duly launched in 1954, and the first edition of the *Atlas of the British Flora*, in which some 1600 taxa were mapped on a 10km grid basis, was published in 1962.

The *Atlas* stimulated a vast amount of interest in recording. This activity aimed to update the initial maps, and to improve the recording of critical taxa (the *Critical Supplement to the Atlas of the British Flora* was published in 1968). Many County Floras were (and are still being) produced, and national projects were undertaken to assess the distribution of our rarer species (the Red Data Book being published in 1977 and, more recently, the Scarce Plants Project in 1994). In 1987, the BSBI Monitoring Scheme (1987) made a detailed analysis of one in nine 10km squares as a basis for monitoring change in the British flora. The data also indicated just how out of date the original *Atlas* was becoming.

By 1993, the third edition of original *Atlas* was in its third reprint, and it was obvious that an update was overdue. An application for funding a new *Atlas* project was accepted by the Department of the Environment (DoE), and a contract was awarded to the Institute of Terrestrial Ecology (ITE) in 1996. The data collection part of the contract was sub-contracted to the BSBI, and the *Atlas 2000* project was born.

The Atlas 2000 Project

Data are being collected on a 10km square (hectad) basis. All 2504 native and 1625 alien taxa (4129 in total) that appear in full in Stace (1991 and 1997) are covered by the project (although we are not covering the microspecies of *Hieraceum, Rubus* or *Taraxacum*). Species will be mapped in three date classes (up to 1970, 1970 to 1986, and 1987 onwards), and differentiation will be made in colour between native and alien records.

This will be the first time many alien taxa will be mapped, and we are therefore placing extra emphasis on improving alien recording and collecting historical data. We are encouraging recorders to provide some indication of the status of an alien in a square. Five status categories have been defined as follows:

- **Established** - a taxon which has been present in the wild for at least 5 years and is spreading vegetatively or is effectively reproducing by seed
- **Surviving** - present in the wild for at least 5 years, but neither spreading vegetatively nor reproducing effectively from seed
- **Casual** - present briefly i.e. for less than five years, or intermittently
- **Planted** - deliberately planted by man in a "wild" situation, not established
- **Alien** - when the recorder is unable to apply one of the above

We should therefore be able to get a much better understanding of the behaviour of alien taxa in different parts of Britain and Ireland. Note, however, that these categories apply equally well to taxa that may be native in one area, but alien in another (such as *Menth pulegium* in a layby in Wester Ross).

Vice-county Recorders are responsible for collecting the data. Each Recorder is responsible for their own hectads, and those on Vice-county boundaries ("shared squares") have been allocated to one of the VC Recorders involved (they are then responsible for retrieving records from the other part of the square, and collating them into one set of data for the square). Once submitted in a suitable format, the data are passed on to the Biological Records Centre at the Institute of Terrestrial Ecology, Monks Wood, where it is entered onto the Vascular Plant Database. From this Oracle database, the *Atlas* will be produced in various formats (book, CD, Internet).

Data are being submitted in two formats, either on computer disk or Mastercard. One aim of the project is to improve the computerisation of our Vice-county Recorders, as this cuts down input time at Monks Wood (thereby allowing more detailed records to be submitted easily), and reduces the possibility of errors through re-entry of data. We have produced a Data Transfer Standard which outlines the format of records to ensure compatibility with Monks Wood, and recommended computer software suitable for achieving this. We are expecting half the data to come in on disk.

Master card (version 1.0) for British 10-km square ..... VC ..... (unless stated)

Name	BRC no.	VC	stat	87+	70+	p70	Name	BRC no.	VC	stat	87+	70+	p70
Carex atrofusca	346.						Carex hostiana x viridula (	2609.					
Carex bigelowii	349.						**Carex humilis**	383.					
Carex bigelowii x nigra (C.	2600.						**Carex lachenalii**	384.					
Carex binervis	350.						Carex laevigata	385.					
Carex binervis x laevigata	2881.						Carex laevigata x pallesce	2882.					
Carex binervis x punctata	2885.						Carex laevigata x viridula	7207.					
Carex binervis x viridula (	7210.						Carex lasiocarpa	386.					
Carex buxbaumii	352.						Carex lasiocarpa x riparia	2889.					
Carex capillaris	353.						Carex limosa	388.					
Carex caryophyllea	355.						**Carex magellanica**	403.					
Carex chordorrhiza	356.						**Carex maritima**	389.					
Carex curta	359.						**Carex microglochin**	390.					
Carex curta x echinata (C.	2599.						**Carex montana**	391.					
Carex curta x lachenalii (C	2895.						Carex muricata	398.					
Carex curta x paniculata (	7212.						C. muricata subsp.lampro	398.2					

Figure 1. Part of the Atlas 2000 Mastercard. Taxa are arranged in two columns with their name and BRC number. If a taxon occurs in the square, a tick is placed in the most recent date class column (*87+*, *70+* or *p70*, meaning 1987 onwards, 1970 to 1986, or pre-1970 respectively). If the taxon is alien to the square, a status category is placed in the *stat* box. The *VC* box is used to differentiate Vice-counties in squares including more than one Vice-county. Finally, taxa that are Rare or Scarce in Britain are given in bold to encourage the submission of extra data (using Individual Record Cards).

The other recorders will submit data using a specially designed *Mastercard.* This 46 page document allows us to collect the minimum data needed to produce the *Atlas* (taxon, grid reference, date class, status, vice-county). It lists all the taxa covered by the project, thereby encouraging recording of aliens, hybrids, subspecies, etc. Part of the Mastercard is shown in Figure 1. Although large, a Mastercard is easy to complete, and Recorders have reported compilation times of between 2 and 6 hours. Once submitted and passed to Monks Wood, the cards take from 30 to 60 minutes to enter into the computer.

We have attempted to retrieve data steadily rather than *en mass* by getting Vice-county Recorders to set submission targets for each year. Data from half the hectads are promised this winter, and we have encouraged Recorders to submit at least one hectad already. This is particularly important with those submitting on computer disk, as a variety of software is being used and we have to check they all conform to the Data Transfer Standard. Currently, data have been received for 731 hectads in Britain (26% of the total) from 66 Vice-county Recorders (see Figure 2).

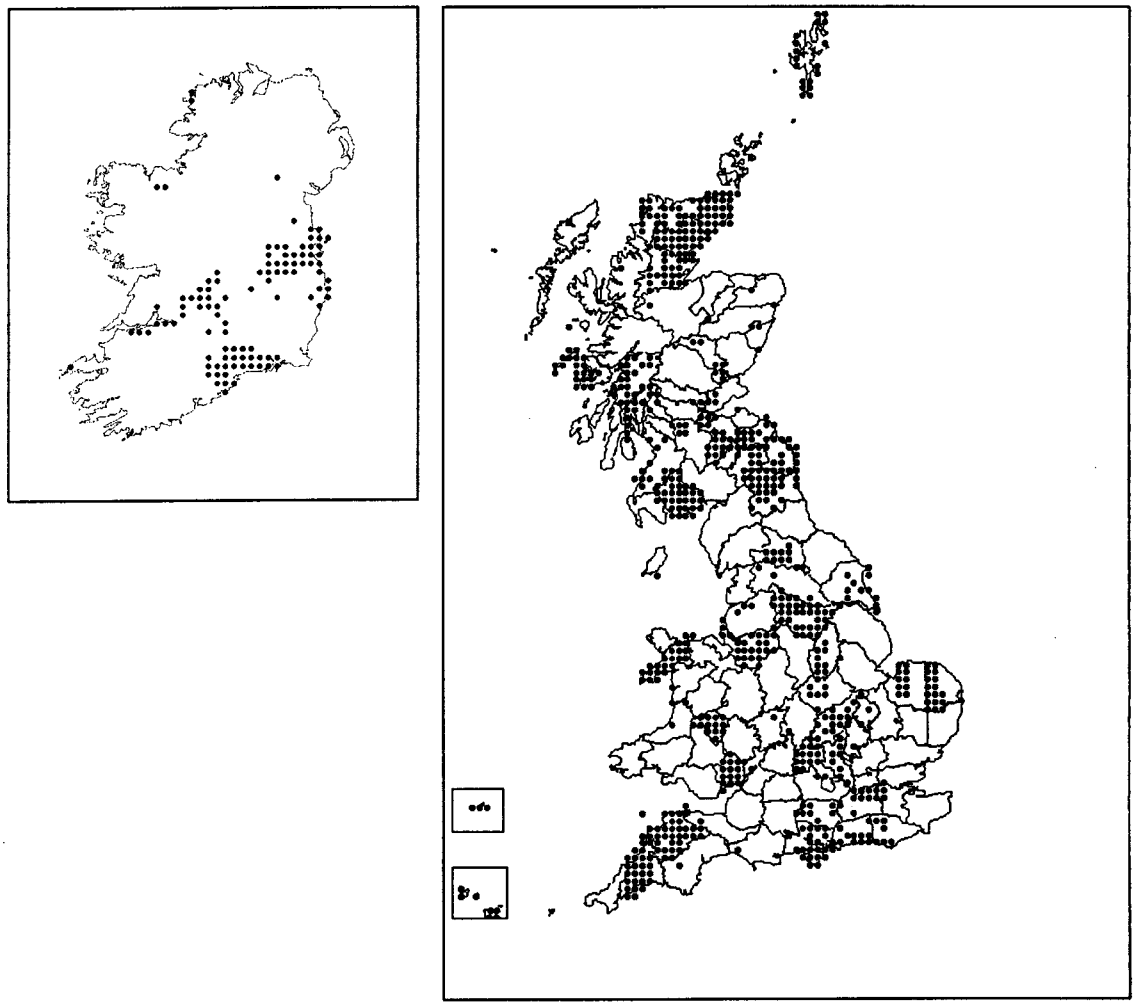

Figure 2. Hectads for which Atlas 2000 data have been submitted (September 1998). The map is a composite of two maps, so scales and position of Britain and Ireland are relative)

In Northern Ireland, funding for the project has come from Environment & Heritage Service (EHS). All field records are being sent to **CEDaR** (Centre for Environmental Data and Recording), where it is being entered onto a Recorder database. At the end of the project, all the data will be exported by disk to Monks Wood. Recently, funding from EHS has allowed the appointment of a part-time data inputer.

In the Republic of Ireland, all records are coming in by Mastercard. These will then be entered into computer by volunteers, and then transferred to Monks Wood on disk at the end of the project. Mastercards have currently been completed for 150 hectads (see Figure 2).

The final *Atlas* will probably be a two volume publication. With so many taxa covered by the project, constraints of time and space mean we cannot map every taxon. Criteria have been drawn up to decide which species will be mapped, and a provisional list of qualifiers produced. Of the 4129 taxa in the project, we expect to map around 2300; data on the taxa not being mapped will appear in an appendix. Each map will have a short caption giving the habit and habitat of the species, a summary of changes in distribution since the last *Atlas,* any conservation status that applies, and an indication of world-wide distribution. There will also be an extensive list of references.

A Few Problems

A project of this size and scope obviously encounters problems and limitations, and it's important to identify these as early as possible. A major limiting factor in the final quality of the data is the lack of recorders in some areas. We have attempted to identify these, and then lead recording field meetings to them to improve coverage. A very remote 10km square in the highlands of Scotland is naturally going to receive less attention than a highly populated square in lowland Sussex. Feedback from Vice-county recorders is vital (i.e. which areas need more attention) and field meetings have currently been very well attended. Not all Vice-county Recorders are willing or have enough time to contribute to the project, and helpers have been found in such cases. New recorders often do not inherit their predecessors records, leaving much work to be done in areas perhaps considered well recorded.

Critical species, hybrids and aliens are almost always under-recorded. We have published booklets and held national and regional workshops to help counter this, and a new Plant Crib is planned. Critical genera present specific problems, and we are encouraging referees to determine material quickly and recorders to make voucher specimens. Historical records from floras and herbaria are valuable but time consuming to extract; volunteers have been helpful in many cases.

The *Atlas 2000* project is very much a data collation exercise. The extraction of data from other sources (such as Local Record Centres, Wildlife Trusts, County Councils, National Parks) locally depends on the Vice-county Recorder. This is very heterogeneous - some Vice-county Recorders actually run their Local Record Centre, while others don't even know they exist. Regionally, the provision of data depends very much on money and commitment; some country agencies have been exemplary in funding and initiating data extraction, others have done very little. Data quality is often a problem, and a preliminary extraction on some data is always worthwhile.

Recorders have not always been on target with their data submission. Computerisation is proving to be a big problem for novice computer-users. Large amounts of tetrad or monad data takes time to input and this, coupled with time needed to learn how to use the computer and software, has caused many Recorders to revert to submitting their data by Mastercard.

The checking and editing of records will be very time consuming. All data for the original *Atlas* have now been entered onto the database at Monks Wood, and maps of this data are being produced and checked. Once *Atlas 2000* data are submitted for a square, they will be checked by the return of a summary species list and "discrepancy list", which will give records already held by BRC but apparently not known by the Vice-county Recorder.

The production of species captions and the *Atlas* text will also take time. The captions are being written by volunteers, but the collation and editing of them has yet to be arranged. Analysis of distributional changes can only be done once all the data are in (the deadline for submission is November 1999), so all captions will need further work just before publication. Many chapters can also only be written once the database is completed; lists of rare and scarce species, for example, may be reviewed in the light of the results.

The New Atlas after the year 2000

The main objective of the *Atlas 2000* project is the production of the Vascular Plant Database. Once the project closes, we very much hope this database will be continually updated. This will involve adding new data (from the field and from historical sources), refining the existing data (e.g. entering tetrad data where only hectad data are currently available), and making corrections to existing data. The recording of aliens, hybrids and critical taxa should always receive more attention.

The computerisation of our Vice-county Recorders will undoubtedly continue, together with the export of data to Monks Wood. The Data Transfer Standards we have produced are a good starting point, but need to be refined and improved. This is particularly important in view of the development of the National Biodiversity Network. As data flow between people and organisations improves, the need for robust standards will increase.

Another lesson from the project so far is the need for back up and support. Simply supplying computers and software to Vice-county Recorders is not enough. Users need to know how to structure their data from the beginning, but then constant support is necessary as the backlog of data takes time to input, and problems and queries arise constantly during this period. Most importantly, the desire to computerise has to come from the recorder themselves, otherwise they will quickly lose interest when problems and delays occur. They also need to know the limitations of a computerised system and realise that it's not the be-all and end-all of their record catalogue.

The whole field of recording is undergoing significant changes at the moment. The role of the BSBI Vice-county Recorders is constantly shifting and more demands are being made of them yearly. Perhaps it is time we reviewed our current position, helping our Recorders to see their position in a broader context and preparing them for future changes. More guidelines are needed to advise them on how to collect, store, report and distribute records in the most efficient manner. We must not, however, forget that their role is vital to our understanding of the British and Irish flora, and that they are all volunteers.