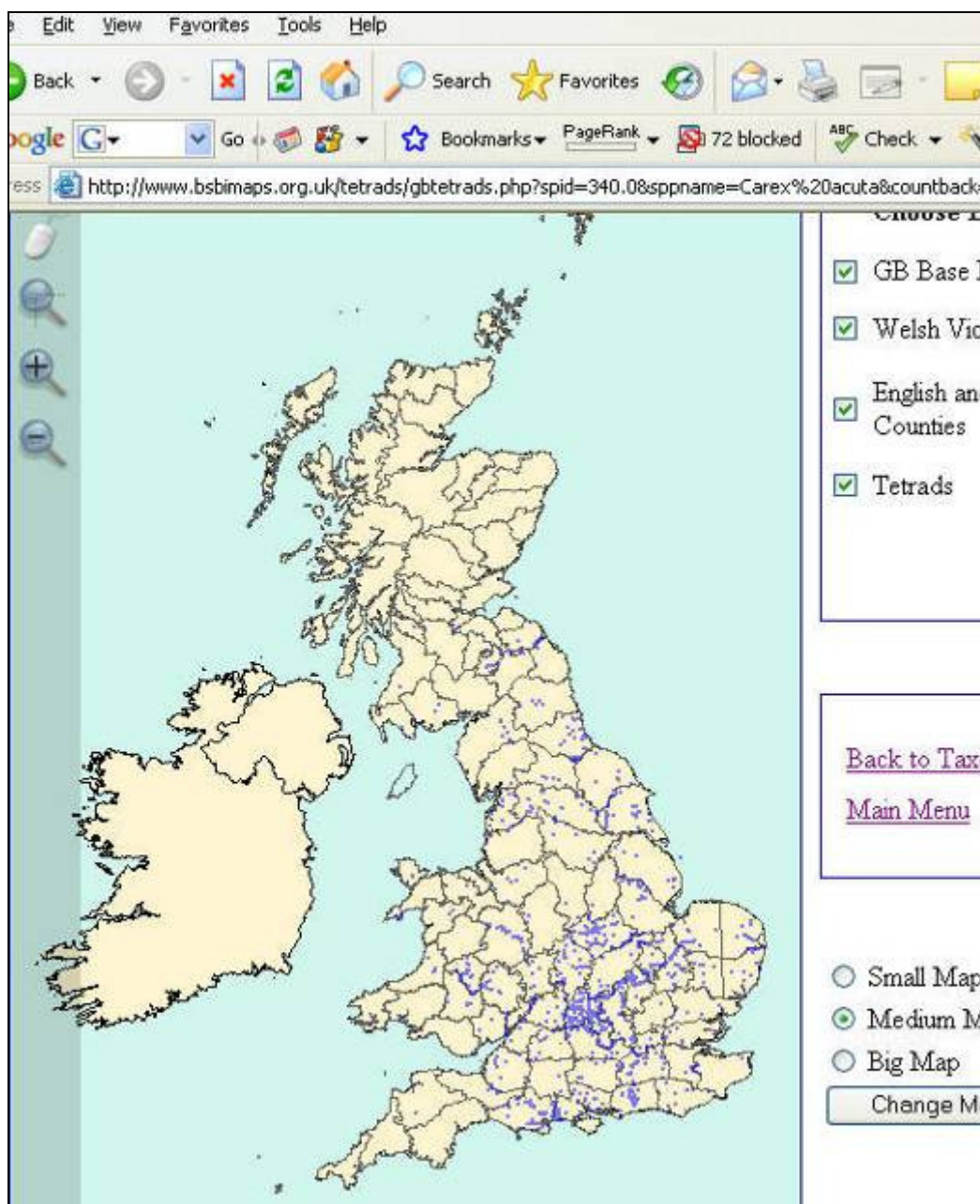


# BSBI Recorder



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Spring 2008



--- Introducing the Tetrad Maps Scheme ---

# BSBI Recorder 12

A newsletter for county recorders, referees and herbarium curators in the Botanical Society of the British Isles

Spring 2008

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## Contact details

### **Project Manager & Hon. Gen. Sec.**

David Pearman, Algiers, Feock, Truro, Cornwall, TR3 6RA  
01872 863388 dpearman4@aol.com

### **Head of Research & Development**

Kevin Walker, 97 Dragon Parade, Harrogate, North Yorkshire, HG1 5DG  
kevinwalker@bsbi.org.uk, 01423 544902

### **Committee for Ireland Representative**

Caroline MacDaeid, Avondale, Moynalty, Kells, Co. Meath, Ireland  
macdaeidassociates@eircom.net

### **Watsonia Records Editor**

Mike Porter, 5 West Avenue, Wigton, Cumbria, CA7 9LG  
01697 343086 mike@carex.wanadoo.co.uk

### **Referees Organiser**

Mary Clare Sheahan, 61 Westmorland Road, Barnes, London, SW13 9RZ  
020 8748 4365 m.sheahan@rbgkew.org.uk

### **Volunteers Officer & Rare Plant Registers project officer**

Bob Ellis, 11 Havelock Road, Norwich, NR2 3HQ  
01603 662260 bob@elymus.demon.co.uk or volunteersofficer@bsbi.org.uk

### **Scottish Officer**

Jim McIntosh, Royal Botanic Garden, Inverleith Row, Edinburgh, EH3 5LR  
0131 2482876 j.mcintosh@rbge.ac.uk or 0141 5527322 (home)

### **Maps Scheme Database Manager**

Quentin Groom, Louis Pelserssquare, 3080 Tervuren, Belgium  
qgroom@botanicalkeys.co.uk

### **Coordinator**

Alex Lockton, 66 North Street, Shrewsbury, SY1 2JL  
01743 343789 coordinator@bsbi.org.uk

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Botany Department, Natural History Museum, Cromwell Road, London, SW7 5BD

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## Summary

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Our annual list of the important things to do...

- Try to cover as much ground as possible in the next two years, before Date Class 4 ends. We're not asking for a massive effort – just a steady rate of re-recording. If every county recorder surveyed just 2 hectads a year, on average, the Maps Scheme would achieve fairly good coverage.
- For county recorders who are on email, please let us know whether you are happy for your addresses to go in the Yearbook. We still try to insist that all consultants and other bodies approach us for approval if targetting more than one or two Recorders, but email addresses do make it easier for people to approach you direct!
- Be prepared to help with surveys for a few rare plants in your area, when contacted by Kevin Walker.
- Referees for the more complex groups might consider taking on a database for their speciality. There are good databases for *Taraxacum* and *Epilobium* hybrids already, but many other groups could benefit from some detailed study.
- Consider coming to the annual Recorders' Conference to give a talk, run a workshop or just to let us entertain you for a weekend.

**Recorders' Conference**  
**12<sup>th</sup> – 14<sup>th</sup> September 2008**  
**Shrewsbury**

Starts: lunch time on Friday 12th at The Gateway, Shrewsbury

The theme is: 'what is the purpose of nature conservation?' and there will also be talks on the work of the Society and on taxonomic subjects. Offers of talks, posters & workshops welcomed.

Speakers booked so far (subject to confirmation) include: Alan Silverside, Fred Rumsey, Chris Preston, Mark Spencer, Raj Whitlock & Simon Smart.

Workshops will include: microscopy (Martin Godfrey), sedges (Mike Porter) and a mystery subject by Arthur Chater.

Grants of 50% are available for students.

The cost is £140 for shared room; £165 for a single room; full board & lodging. Accommodation is at Preston Montford Field Centre.

The programme ends with lunch on Sunday, following a field meeting or workshops in the morning.

Please send cheques (made out to BSBI) to Alex Lockton, 66 North Street, Shrewsbury, SY1 2JL specifying any dietary or other requirements.

## Progress with the Maps Scheme

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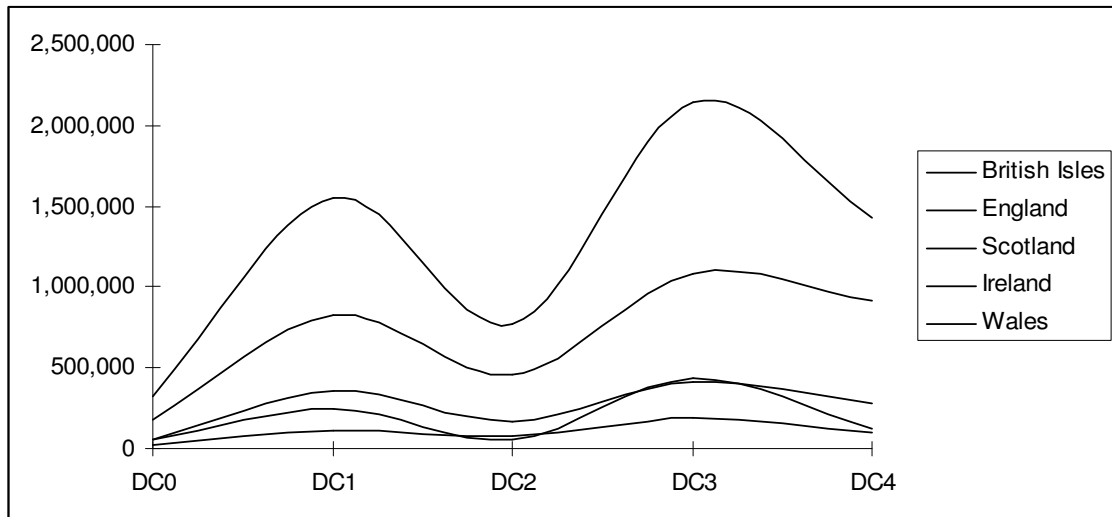
Many thanks to everyone who has sent in records for the Maps Scheme, or who uses Mapmate and regularly sends data to Bob Ellis. After a couple of years of operation, the scheme is becoming quite well established, and we can begin to think about what it can reasonably be expected to do.

One thing we have been giving a lot of thought to recently are the dateclasses that we record within. For the last Atlas we used two dateclasses to look at change between 1930-69 and 1987-99 and this proved very effective for displaying on maps and in elucidating trends for many species. There were weaknesses, however, mainly because of the uneven length of each dateclass and the greater recording effort in the later survey period. One way to overcome these limitations is to concentrate our recording within set periods, such as decades. This helps to reduce variation in recorder effort between dateclasses enabling much more meaningful analyses of change through time to be carried out.

We have been trialling this approach with DC4 which is due to end on the 31<sup>st</sup> December 2009. This means that there are just two more years of fieldwork to get all the hectad data we need to make the analyses for the next Atlas more meaningful. Some counties, of course, will not achieve very good coverage in DC4 – but there are always some counties that will do better or worse in any date class. The annual level of recording in DC4 has been 74% of that in DC3 overall, and 95% in England. Because of inevitable delays in computerising and submitting data, this means that we probably are doing more recording now than ever before.

The graph shows a horrendous trough in DC2, followed by a peak in DC3. These would not be so prominent if the Monitoring Scheme data were included in DC2 rather than DC3. It would be a fairly straightforward operation to bring forward the end point of DC2 to 1989, which would give us remarkably even coverage in each of the date classes. The down side to that is that DC3 would no longer be precisely the same as the ‘current’ date class in the New Atlas, but that might be a compromise worth making.

**Numbers of records in each Date Class (projected to the end of DC4)**



Alternatively, we could use statistics to compensate for fluctuations in recording levels and for different lengths of the date classes. For example, if DC3 is 13 years long and DC4 only 10, then a simple factor could be used to compensate for the over-recording in DC3. A similar technique is employed by Tim Rich in his paper in this newsletter, on which he spoke at the conference last year.

Another thing we can do is to focus computerisation efforts on obviously weak points in the time-series data. DC0, for instance, is low only because there are millions of herbarium sheets

that have not yet been computerised, and we believe it will eventually be much more adequately covered. This is important because changes in plant distributions are slow and, the longer our time series, the more powerful the possible analyses will be.

The use of decadal dateclasses is very appealing and has many advantages over the rather uneven DCs of the previous Atlases. Over the next year we will be weighing up the pros and cons and thinking about how to improve on this approach in the future, in particular the updating of individual hectad records that were produced as 'Mastercards' in the last Atlas. We hope to bring you more on this in the next BSBI Recorder so watch this space!

## Progress Statistics

Number of records for each county in each date class, as of February 2008.

VC	DC0	DC1	DC2	DC3	DC4	42	1,099	8,885	4,922	12,081	630
1 <sup>†</sup>	7,880	14,458	12,879	16,071	10,843	43	7,773	8,187	8,885	9,205	2,153
2	8,832	16,963	11,471	23,640	15,855	44	314	10,343	3,021	22,744	12,971
3	3,852	23,491	5,802	35,928	15,142	45	4,189	11,026	10,113	14,993	3,051
4	2,399	15,729	4,131	20,602	9,025	46	1,094	9,000	4,688	20,749	18,328
5	1,577	11,806	3,344	26,174	12,942	47	321	8,466	3,361	15,758	1,375
6	2,294	15,230	11,746	27,900	15,067	48	1,211	9,228	3,312	9,051	983
7	443	11,361	12,206	12,904	3,322	49	2,177	11,685	4,004	19,412	13,807
8	868	12,725	16,119	17,937	4,651	50	614	8,145	13,656	16,980	1,610
9	2,248	24,617	10,645	31,181	14,648	51	907	5,211	2,732	6,109	769
10	1,178	4,933	2,333	3,294	6,309	52	942	5,967	3,167	9,126	6,631
11	2,204	15,342	5,518	23,926	16,773	53	3,675	14,212	4,309	19,004	1,396
12	12,009	12,832	6,281	16,342	9,802	54	6,302	22,862	6,977	28,414	3,406
13	1,086	14,334	2,132	15,916	17,371	55	841	13,144	17,625	12,403	1,871
14	1,506	16,910	3,492	16,372	15,974	56	1,411	14,875	1,756	17,462	2,891
15	1,158	18,383	6,691	20,706	1,409	57	2,267	13,600	5,089	17,720	16,262
16	1,663	13,255	4,756	14,826	3,885	58	3,967	14,467	3,096	23,356	17,028
17	4,329	20,500	9,734	23,605	15,973	59	1,725	13,675	2,658	22,094	25,932
18	3,340	10,518	3,781	13,095	8,170	60	3,703	16,459	4,129	12,651	4,439
19	5,313	15,117	4,106	22,401	3,939	61	1,764	14,578	14,180	15,734	5,813
20	3,608	12,895	4,287	18,097	2,423	62	3,585	16,024	3,256	21,367	5,747
21	3,649	8,724	2,256	7,616	4,157	63	1,197	13,463	5,741	18,093	12,476
22	1,454	18,821	8,666	24,172	23,823	64	1,656	17,845	4,263	27,102	4,550
23	2,140	19,074	18,846	17,452	3,419	65	2,731	11,129	4,804	11,928	2,519
24	15,439	14,120	18,235	20,903	8,542	66	2,873	15,107	20,867	18,105	13,344
25	1,883	21,533	11,365	20,062	16,503	67	5,293	18,018	10,535	16,907	9,228
26	1,290	13,392	5,887	13,042	13,040	68	3,867	11,138	6,935	10,475	6,550
27	1,425	15,633	3,710	27,007	13,922	69	1,044	12,790	9,235	19,939	2,588
28	2,877	15,244	3,912	26,335	13,656	70	918	19,085	11,076	25,681	2,886
29	3,028	16,968	12,033	16,631	3,736	71	1,298	5,960	1,461	8,201	81
30	754	10,738	13,561	13,021	11,274	72	858	10,560	4,202	11,485	5,160
31	602	4,382	4,150	5,180	1,499	73	2,465	11,364	7,066	15,853	930
32	563	11,940	2,275	15,674	1,731	74	2,661	6,681	4,010	8,866	5,334
33	836	10,550	15,505	14,428	9,644	75	1,686	11,821	2,457	15,433	186
34	1,115	11,617	16,582	16,541	12,044	76	146	2,707	3,767	5,189	444
35	2,065	6,308	3,724	19,583	1,093	77	874	7,225	2,311	13,712	1,112
36	2,025	10,230	8,521	20,133	4,998	78	711	4,746	3,565	4,369	375
37	2,757	10,336	7,408	21,017	21,736	79	509	2,252	790	3,882	1,135
38	4,107	19,379	3,044	15,404	2,106	80	2,809	7,670	2,508	10,167	2,526
39	6,217	15,939	4,917	20,192	26,195	81	2,025	7,037	5,440	10,161	5,807
40	9,456	3,226	20,409	21,186	16,494	82	1,032	4,881	2,090	6,266	2,053
41	1,362	13,440	9,657	17,804	1,467	83	1,309	5,141	1,512	6,370	510
						84	800	2,318	1,993	4,659	909
						85	2,315	9,244	5,975	13,576	1,370
						86	367	4,261	1,490	8,286	2,747

<sup>†</sup> Excluding Isles of Scilly, which is listed as 114.

87	601	4,396	7,010	8,750	947	207	825	4,998	187	7,903	106
88	2,034	13,625	4,993	13,454	3,748	208	860	5,444	190	12,055	1,421
89	1,083	6,858	4,720	10,853	3,739	209	1,134	8,556	1,248	10,581	4,818
90	931	10,449	2,834	12,156	4,795	210	878	4,262	1,401	13,558	37
91	283	3,826	937	5,908	7,550	211	1,219	4,732	147	7,282	1,800
92	2,954	8,489	2,513	8,420	3,148	212	827	9,030	2,290	15,221	6,721
93	174	6,848	3,293	11,713	13,296	213	1,634	4,104	303	3,006	460
94	1,209	8,364	8,899	6,744	6,746	214	1,182	4,922	264	5,212	1,319
95	459	7,865	2,738	13,669	8,203	215	906	4,896	240	6,246	1,870
96	1,004	21,668	12,047	13,809	5,143	216	1,909	7,843	2,209	10,309	4,260
97	1,543	16,091	7,641	16,019	5,366	217	1,166	5,189	388	6,659	2,387
98	2,464	16,788	2,743	20,783	1,537	218	876	4,866	77	9,063	1,773
99	545	3,152	1,142	5,783	208	219	1,015	3,481	2,500	6,535	1,404
100	532	4,855	4,078	7,095	2,943	220	1,236	5,658	435	11,063	515
101	153	9,544	3,026	10,792	1,494	221	1,065	3,180	908	8,516	316
102	164	7,099	1,844	9,680	602	222	651	4,731	355	12,411	121
103	3,921	11,006	2,934	8,887	6,268	223	1,016	5,087	2,697	9,522	136
104	3,428	13,683	7,224	13,819	12,301	224	618	2,464	171	5,469	0
105	735	11,778	2,779	10,122	1,481	225	1,059	5,983	182	10,140	750
106	580	13,222	5,664	12,807	12,323	226	419	5,287	372	7,659	314
107	323	8,834	3,584	7,463	1,625	227	2,079	11,799	294	12,879	115
108	7,943	11,397	5,185	13,034	6,145	228	1,605	6,944	356	10,173	61
109	734	5,969	7,514	3,851	3,006	229	1,219	3,955	568	11,334	388
110	1,500	16,677	5,743	15,448	13,234	230	571	5,289	126	6,873	120
111	2,467	7,678	2,785	8,179	5,083	231	765	2,098	502	5,432	53
112	2,176	7,712	5,645	10,800	3,679	232	555	2,800	446	8,572	550
113	1,968	4,646	1,377	8,399	2,663	233	4,383	8,468	5,599	13,152	525
114	838	1,647	1,363	2,071	1,823	234	183	4,908	180	11,079	137
201	2,079	10,171	835	13,287	3,824	235	402	9,495	481	13,223	82
202	1,282	3,349	585	14,516	2,603	236	1,180	8,892	4,010	22,574	1,467
203	391	9,963	152	16,919	2,815	237	4,276	5,693	2,626	7,692	191
204	280	5,874	213	13,145	234	238	3,903	10,242	8,574	17,305	6,063
205	412	5,907	207	12,649	45	239	3,639	11,419	11,480	18,776	3,764
206	1,981	6,332	1,432	14,585	19,239	240	1,711	5,838	5,118	11,777	2,377

## Tetrad Maps Scheme

The logical extension of the Maps Scheme is a move towards tetrad mapping, which we have started to develop for the Tetrad Maps Scheme, or TMS. This is a new web site that displays maps of all British species at the tetrad scale, which has been developed for us by Alan Hale using data collected and managed by Quentin Groom.

The map on the front cover is an example of the progress of the TMS to date. It shows *Carex acuta* which, fortunately, almost everyone records to tetrad scale or better. The maps of commoner species are horribly patchy, because some counties have been able to give us the data for their tetrad Floras and others have not. It will probably be some time before all counties in Britain have this scale of coverage for all species. The TMS does not currently cover Ireland, but that is only because it is difficult to get the software to cover for both the grid systems simultaneously. We will include Ireland presently, if the Irish recorders want us to.

The difference between a hectad and a tetrad distribution map of a species is enormous. Hectads effectively show the range of the species whereas tetrads show the distribution in a far more meaningful way. One can trace rivers and contours and the geology of the substrate. You can dial up to the TMS right now and see how the maps are developing: the link is on the Atlas page of the web site.

# Threatened Plants project – a pilot for 2008

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Kevin Walker (kevinwalker@bsbi.org.uk)

For many years the word ‘threatened’ was synonymous with ‘rare’ with species occurring in fewer than 115 hectads being the main focus of conservation action (i.e. Red Data, Nationally Scarce). More recently, however, the term ‘threatened’ has been refined to include any species, regardless of how common, that has suffered significant declines (Cheffings & Farrell 2005). As a consequence, the new British *Red List* includes many widespread taxa that have undergone dramatic declines (e.g. *Scleranthus annuus*) but not, for the first time, national rarities whose populations appear stable (e.g. *Carex chordorrhiza*). We know very little about many of former group of species and urgently require more information on their ecology, distribution and changing status.

In 2008 we propose to work on the following ten ‘widespread’ but declining species:

<i>Astragalus danicus</i>	<i>Monotropa hypopitys</i>
<i>Blysmus compressus</i>	<i>Campanula patula</i>
<i>Crepis mollis</i>	<i>Gentianella campestris</i>
<i>Ophrys insectifera</i>	<i>Pyrola media</i>
<i>Scleranthus annuus</i>	<i>Stellaria palustris</i>

Many of you will be familiar with most, if not all, of these species from your own vice-counties where they are likely to be genuinely rare or scarce. All are confined to low fertility habitats and, with the exception of *Campanula patula* and *Crepis mollis*, are relatively widespread in Britain and Ireland occurring in over 200 hectads (over 900 in the case of *Scleranthus* and *Gentianella*). We therefore expect that trends for at least some of these species will help us to understand the nature and scale of recent environmental changes more generally (e.g. habitat loss and fragmentation, eutrophication, climate change).

For each species we aim to (1) update the present distribution of each species in each vice-county and (2) undertake a targeted survey of 100 populations nationally to assess the causes of recent trends and collate habitat/management information. The latter will provide a baseline from which future population changes can be assessed as well as helping to inform future conservation management. By trialling a number of new methods (e.g. 100m recording, null records) we also hope to refine the BSBI approach to the recording rare/scarce species more generally.

## What we would like you to do?

As part of the project we will be asking recorders to do two things:

- **Check and verify records:** During the spring we will collate BSBI records for each species and then send them to you for checking and verification. In particular we would really like you to provide (a) more precise details for unlocalised records (i.e. those just assigned to hectad) or those where the status is uncertain (i.e. old records) and (b) any additional records to the ones we hold.
- **Targeted sample survey:** For each species we will pre-select a national sample of 100 populations for detailed survey. We will send you the details of any in your vice-county and ask you to visit them during the summer of 2008 and record information on population size, extent, flowering, habitat, management and general condition. The list may include some where the species has not been recorded for a long time. Don’t worry



- we would still like you to visit these and where possible tell us why the species is no longer present.
- **Additional populations:** Feel free to survey any other populations of the ten species using the recording forms supplied for this project. Also why not record other scarce species on the same site using the same methodology?

The results of this survey will allow us to produce more detailed and up to date maps as well gain a greater understanding of the ecology and status of these declining species. The fieldwork element will allow us to identify key threats to the species and set up a baseline for future monitoring. We will make the results available as 'status reports' on the BSBI website and provide an up date in BSBI Recorder next year.

If successful, we hope to extend this pilot to a much larger suite of threatened species over the next 5 years culminating in a book of species accounts sometime around 2013.

### What will happen next?

In April you will receive a database of records for each of the 10 species present in your county. We would like you to check through these records for errors or add additional information for unlocalised records which just give a site name, hectad or tetrad. We would also be interested in any additional records you hold that are not already on the spreadsheet. You will also receive details of any sample populations that we would like you to survey within your vice-county. For these we will indicate which ones to visit as well as 'reserve' sites just in case the selected sites are inaccessible. In addition, we will send out detailed guidance on the recording methodology and how best to fill in the forms.

## The Hybrid Project

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David Pearman (dpearman4@aol.com)

Trying to pull together the threads of collecting the data for the forthcoming volume has been one of the most challenging tasks that I have tried over the last 18 years. Projects such as the New Atlas, Scarce Plants and local Floras are comparatively straightforward – one collects data, that data fits broadly into a pattern, identification can be usually a relative certainty and anomalies can be investigated. With hybrids none of those can be depended on.

The prime sources have been what was already in the Vascular Plant Database (VPDB) (that may or may not have supporting detail), what is in Herbaria, what has been published, what lies in the memories and collections of experts and, to a much lesser extent, what has been collected in the field over the last three years. A significant proportion of the records in each of those sources has proved to be exclusive to that source. But to make matters much more complicated the same specimen might well lurk under different names in different sources, for naming hybrids is so often an inexact science – so often an investigation reveals that a specimen is ‘probably this’.

The starting point, then, was what we had already collected in the Vascular Plant Database. Alex Lockton and I then circulated the Vice-County Recorder (VCR) network, showing them what was already held and calling for more records. By and large the response was satisfactory, though with some gaps, most notably in the Irish Republic, where access to published works and herbaria is more difficult. We started with some 70,000 records, and thanks to Alex’s compilations, have added another 100,000 or so.

At the same time we ran a project with Alan Forrest from the Botanic Garden in Edinburgh, who had just finished his PhD in montane *Salix*, whose task was to search major herbaria for genera that we considered would yield a significant proportion of new records. These included *Epilobium*, *Euphorbia*, *Euphrasia*, *Mentha*, *Rumex*, *Sagina*, *Salix* and *Ulmus*. He was to database specimens that had been determined by researchers that were reliable and accorded with modern taxonomic concepts, adding his own expertise on *Salix*, that of Ray Harley on *Mentha* and others too. In parallel to this Alison Lean, from Wye, worked at the Natural History Museum, collecting data to the same criteria and working with Geoffrey Kitchener to build up a database of *Epilobium* hybrids.

Of course this herbarium work produced relatively few records, and only covered the major Herbaria. But it was quality data, often noting any previous determinations, and was aided again by the project ‘Herbaria at Home’ where Alan took digital images of specimens and posted them on the Web for himself and others to determine at a later date.

But it was only then that the real detective work was able to start, aided by a really innovative idea from Chris Preston, namely to map any hybrid records against an underlay of the distribution of their putative parents. Of course this is not true of all hybrids, but it is a *sine qua non* in most.

From this set of maps I was able to raise a preliminary set of queries to VCRs, supplemented by questions on data submitted for the rarer hybrids where the data was inadequate. Thus a record for *Centaureum erythraea* x *littorale* with only ‘1987+’ (indicating it came in on an Atlas mastercard) with no other details, would be queried and frequently would turn out to be an inputting error.

A further significant set of queries arose from comparing the Vice County Census Catalogue (VCCC) with the data we had in the VPDB. There were about 1500 entries in the former that even after all other avenues had been explored were not in the database, and this too has involved going back to the source of the record (often in the more obscure literature or the VCRs files). But many are still unresolved, albeit often because the underlying record is not assignable to a 10km square.

Then there were references in the accounts of each taxon, written largely by Clive Stace, but also by experts in their own genera. For some of these accounts we had no records at all. Most though contain indications of many further records, which I have investigated and added where I can, but, much more frustratingly, often no mention of some of the records that we have collected from other sources! So, back to the authors, with the request that 'we have records from x vice-county, not mentioned by you, are they correct?'

As I write, at the end of February 2008, we are at the last stage. We have collected almost all the data we are likely to have time for and run the checks that I have referred to, though I am sure there are still instances of the same record with more than one determination. Clive Stace and his colleagues have written their accounts and I have tried to cover queries arising from those. We need a new set of maps that will reflect all these additions and alterations, but then I will have to transcribe all the comments on earlier sets that reflect records and anomalies that I have already investigated and found correct. Chris Preston will now write a paragraph on the distribution of each hybrid, using the data I have edited and a final set of maps, though I am absolutely certain that this will raise a further set of queries that are worth investigating!

Now, how to map that montane willow that Buchanan White thought was x, but Linton, looking at the specimen in Edinburgh thought was y, that the distinguished Russian I. Belyaeva now thinks is z, but David Tennant, going back to the original locality, might have gathered the same plant that he has grown on as a, though genetic work at Edinburgh suggests might have b in it?

Expect the final work in about a year or so!

## *Carex maritima* update

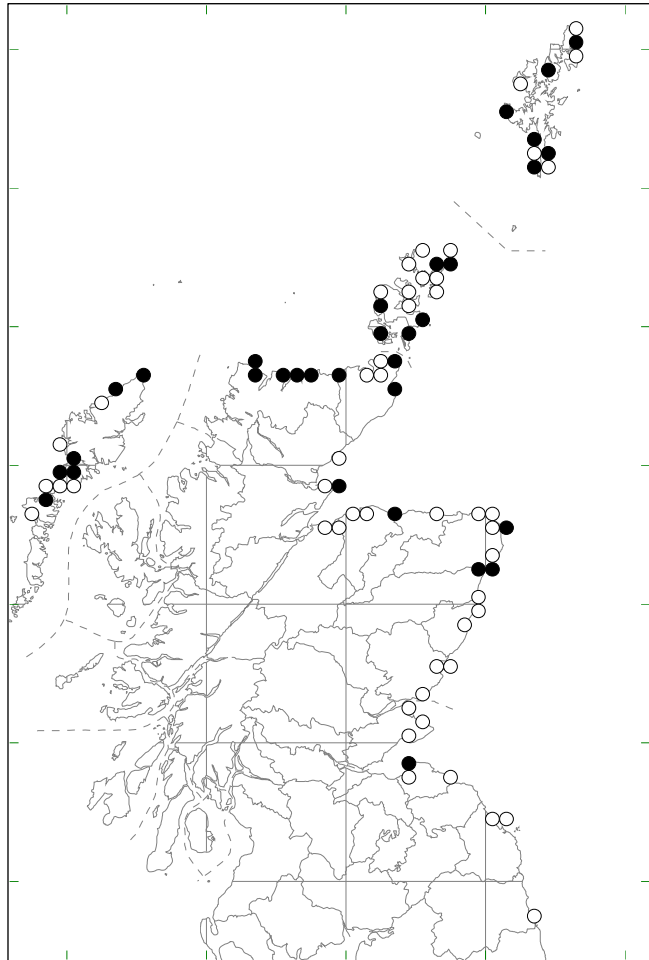
David Pearman (dpearman4@aol.com) & Alex Lockton (coordinator@bsbi.org.uk)

Since last year there have been a few more discoveries. Tom Dargie and, independently, Ian Green, found thousands of plants at Menie Links, north of Aberdeen (NJ9921). This site has been fiercely fought over during the last year as it is the target of a property development proposal. Meanwhile, in the adjacent hectad, NK02, David Welch refound a small population of just 26 plants at Hackley Bay. These finds make it seem worthwhile searching the east coast more carefully. Meanwhile, Mark Spencer kindly sent details of the specimens at the Natural History Museum (BM), which added several old sites to the database. There are now 32 post-2000 and 48 pre-2000 dots on the map.

We are fairly confident now that the recently known but apparently lost populations really have disappeared. Most of them were declining anyway, due to changes in habitat – usually natural succession. A proportion of recently lost sites were in very atypical habitat, though, such as airfields, pasture and golf courses. It seems quite possible that these were in fact anthropogenic populations, created when sand containing seeds of this species was spread over bare ground. The *C. maritima* may have flourished for a few years but was doomed from the start.

So the challenge now is to find entirely new populations. This is the holy grail for botanists – to find new sites for rare species. There's no scientific method for this: we just have to look at every sandy beach, focusing effort on the margins of streams and dune slacks. It is also worth looking in the vicinity of old sites, as we believe it is a species with long-lived seeds, adapted to reappear when favourable conditions return.

One question about *C. maritima* that is currently unanswerable is why it does not occur on the west coast of mainland Scotland. The dots on the west coast of England have recently been removed from the maps, as they were found to have been erroneous. What could be so very different about the west coast? There are plenty of sandy beaches and dune systems, so on the face of it there should be suitable habitat. One possibility might be ocean currents, but it is not obvious how this could be having an effect. A more likely one could be isostatic rebound, as the sea generally retreats from the west coast, possibly leaving *C. maritima* populations high and dry. Is it conceivable that this could, over long periods of time, be sufficient to eradicate the species? Observations on whether thriving populations are found on accreting or eroding dunes might help answer this question. Are there any other species that exhibit a similar distribution?



The hectad distribution of *C. maritima*, showing post-2000 records as black dots.

# A method for predicting dates of extinction in the British flora

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T.C.G. Rich, Department of Biodiversity and Systematic Biology, National Museum of Wales, Cardiff CF10 3NP, U.K.

## Introduction

Cheffings & Farrell (2005) have recently revised the 'Red List' status of the vascular plants of Great Britain using the IUCN (2001) threat criteria. This was a welcome advance on previous Red Lists where rarity had been used to indicate conservation status rather than the actual threat to the species. The IUCN threat categories are assessed using a combination of information on population sizes, distributions, trends, etc., and allow most threatened taxa to be prioritized for conservation action.

Among the highest priority taxa for conservation are those in imminent danger of extinction, and 'Criterion E', a quantitative analysis of the probability of extinction in the wild (IUCN 2001), sets out a series of thresholds against which the species can be ranked. Unfortunately, Cheffings & Farrell (2005) were unable to apply Criterion E to their assessments as so few population viability analyses have been published on British plants. They were, however, able to utilize data in the assessments for some declining species on the trends in the area of occupancy or extent of occurrence, which give an indirect measure of trends towards extinction. They pointed out more information was needed.

I have recently developed and tested simple models of assessing changes in frequency over time which can be used to predict the probability of extinction without having to have full population data (Rich 2006; Rich & Karran 2006). The models can be applied to predicting extinction from the numbers of sites if detailed records are available, or to hectads if they are not. In the models, different estimates of frequency were compared for each species, and the best methods had a correction for the amount of recording over time, summarized records by decade or moving average, and used an extrapolation of presence between first and last records. By assuming that frequency trends in the past are likely to reflect trends in the future, a timescale for extinction can be predicted by extrapolating from trends in the

current records. In this paper I demonstrate the method of predicting extinction and test it against the species analyzed in detail by Rich & Karran (2006).

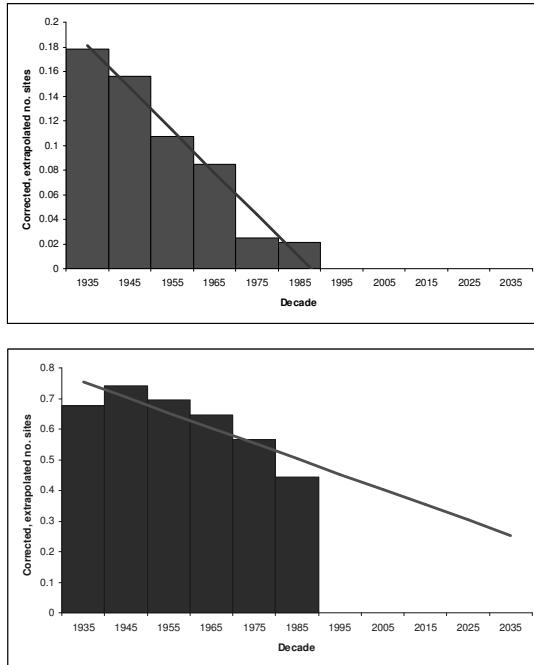
## Method

Reasonably comprehensive data sets of the historical records were compiled for the following 13 species: *Alyssum alyssoides*, *Asparagus prostratus*, *Berteroa incana*, *Bromus interruptus*, *Carex depauperata*, *Filago lutescens*, *Filago pyramidata*, *Fumaria purpurea*, *Galeopsis segetum*, *Melampyrum sylvaticum*, *Salvia pratensis*, *Schoenoplectus triqueter* and *Thlaspi perfoliatum* (full details are given in Rich & Karran 2006). *Ajuga pyramidalis* was excluded as the data for the former suggest it is increasing (and thus not likely to become extinct), and *Ambrosia artemisiifolia* was excluded as the data are very variable between decades and shows no clear trend.

To assess trends from recent data, records were used for six decades from 1930 to 1989 for all species except the extinct species *Bromus interruptus* and *Galeopsis segetum*, where data for the last five decades during which they still occurred in Britain were used. These six decades were selected as they have reasonably reliable and comparable data, and cover the main period of loss of the flora during the post-war agricultural revolution. To apply the model to more recent data, the correction of recording bias model (Rich 2006) would need extending from 1990 onwards.

For each species, the number of hectads and sites present between the first and last records for each site or hectad, corrected for variations in recording activity (using the recording effort model of Rich 2006), was calculated. The data were first screened using correlations to assess if there were consistent trends for the time period. A regression line was then fitted to the resulting frequency data points for the middle year of each decade (e.g. 1935 for the 1930s). If the regression line intercepted the X-axis (i.e. indicating that the species has a

trend towards extinction), the intercept was calculated to predict the date of extinction and 95% confidence limits. Two example are shown in Figure 1; full data sets for all species are given in Figures 10 and 12 of Rich & Karran (2006).



**Figure 1.** Corrected extrapolated number of sites for each decade for *Carex depauperata* (top) and *Salvia pratensis* (bottom). Best fit (not regression) lines showing trends towards extinction are also shown.

The predicted dates of extinction were then used to assess the likelihood of extinction using 1989 as the baseline year (the last year of data included). The species were assessed for threat status using the IUCN (2001) definitions for Criterion E: Critically endangered (CR), probability of extinction is at least 50% within 10 years or three generations; Endangered (EN), probability is at least 20% within 20 years or five generations; and Vulnerable (VU), probability is at least 10% within 100 years. The number of generations was not used as no lifespan data for individual or seeds are available for these species.

## Results

Predicted dates of extinction are given in Table 1 for the 13 species from the extrapolated number of sites, and in Table 2 for the extrapolated number of hectads. Some species could not be assessed using one or

other of the number of hectads or sites as there was no correlated trend in the data.

**Table 1:** predicted dates of extinction from extrapolated number of sites per decade.

Species	Predicted extinction date	95% confidence limits	Sts <sup>†</sup>
<i>Alyssum alyssoides</i>	-		
<i>Asparagus prostrates</i>	2032	2019-2045	VU
<i>Berteroa incana</i>	1984	1962-2005	CR
<i>Bromus interruptus</i>	1968	1956-1983	EX
<i>Carex depauperata</i>	1986	1978-1994	CR
<i>Filago lutescens</i>	2005	1989-2022	EN
<i>Filago pyramidata</i>	1994	1980-2007	CR
<i>Fumaria purpurea</i>	-	-	-
<i>Galeopsis segetum</i>	1975	1960-1992	CR
<i>Melampyrum sylvaticum</i>	2008	1975-2040	EN
<i>Salvia pratensis</i>	2053	1977-2130	VU
<i>Schoenoplectus triqueter</i>	1987	1974-2000	CR
<i>Thlaspi perfoliatum</i>	2005	1981-2029	EN

Extinction dates are similar overall for both the extrapolated number of sites and hectads (both have an average predicted extinction year 1994), and the predicted extinction dates correlate well with the exception of *Melampyrum sylvaticum* which has widely differing dates (it is not clear why). If the *Melampyrum* dates are excluded, the hectad records give longer time periods to extinction than site data, as might be expected as integrating sites to hectads results in loss of sensitivity. The 95% confidence limits average at  $\pm 17$  years for the sites data, and  $\pm 19$  years for the hectad data; they were more variable for the dates predicted from the number of sites (standard errors 4.46 and 2.72 respectively). The wide confidence limits are

<sup>†</sup> IUCN status assessment under category E.

partly a function of the small number of data points available for regression.

The method can be tested for the two species which have already gone extinct, *Bromus interruptus* and *Galeopsis segetum*. *Bromus interruptus* was last recorded in Cambridgeshire in 1972 (Rich & Lockton 2002); the predicted dates are 1968 and 1965, and *Galeopsis segetum* was last recorded in Caernarvonshire in 1975 (Rich & Pryor 2003); the predicted dates are 1975 and 1973 (Tables 1 and 2).

**Table 2:** predicted dates of extinction from extrapolated number of hectads per decade

Species	Predicted extinction date	95% confidence limits	Sts <sup>†</sup>
<i>Alyssum alyssoides</i>	1995	1957-2033	CR
<i>Asparagus prostratus</i>	2011	1988-2036	VU
<i>Berteroa incana</i>	1985	1966-2005	CR
<i>Bromus interruptus</i>	1965	1947-1983	EX
<i>Carex depauperata</i>	1997	1975-2018	CR
<i>Filago lutescens</i>	1996	1984-2009	CR
<i>Filago pyramidata</i>	1992	1980-2004	CR
<i>Fumaria purpurea</i>	2052	1974-2131	VU
<i>Galeopsis segetum</i>	1973	1947-1988	EX
<i>Melampyrum sylvaticum</i>	2042	2017-2067	VU
<i>Salvia pratensis</i>	-	-	-
<i>Schoenoplectus triqueter</i>	1987	1970-2004	CR
<i>Thlaspi perfoliatum</i>	1999	1971-2007	CR

## Discussion

The three key assumptions here are first, that the method for correcting for recording bias with time works; second, that declines occur at a constant rate over the six decades; and

<sup>†</sup> IUCN status assessment under category E.

third, that recent trends can be used to predict future trends.

The assumptions involved in correcting for recording bias due to the marked geographical and temporal variations in recording are discussed in detail by Rich (2006), and the assumptions underlying the best models of assessing change by Rich & Karran (2006). The models work best for species from well-recorded areas such as South-east England and better for more widespread, uncommon species than great rarities. They will not work well for species with incomplete or patchy datasets, or common species where detailed site and hectad data cannot be derived; IUCN threat assessments are in any case covered to an extent for the latter by the trends in the area of occupancy or extent of occurrence (Cheffings & Farrell 2005).

The estimated dates of extinction also depend on the dates selected for analysis; the six decades analyzed here include a period of rapid change in the countryside and decline of plants in general, and are likely to lead to short timescales for extinction. Longer or shorter periods of time could also be analyzed. I prefer applying the same time period for all species.

The application of a simple linear regression model to the data assumes that the rate of decline is constant with time, but this is unlikely to be the case as the pressures on the environment are constantly changing, and the factors causing decline in populations change with time. For example, the widespread use of fertilisers, herbicides and drainage from the 1950s to the 1970s which resulted in widespread losses of semi-natural grasslands and their plants has been replaced with conservation management schemes such as Countryside Stewardship which aim to reverse the trends. Similarly the recent hot summers linked to global warming have resulted in a resurgence of Mediterranean annuals which grow better in a warmer climate. Plants may also show an exponential decline rather than a linear decline, especially as once plants become very rare they are often put into conservation programs to prevent extinction. The method, as applied here retrospectively to the data up to 1989, suggests that some of the species tested should have already become extinct, and may

well have done had they not been taken into conservation programmes. Very few of the species tested are predicted to become extinct within 100 years using exponential or logarithmic based-models (data not presented). Past performance may not be a good predictor of future performance, as anyone investing in financial markets knows.

There are clearly many problems with the underlying assumptions. The predicted dates of extinction must be taken with caution, and they are perhaps best used to indicate which species are worth examining in more detail using demographic methods. None-the-less, this relatively simple method of predicting dates of extinction can be applied to all

Nationally Rare and Scarce species for which reasonably comprehensive quantitative data sets are available, and thus provides additional information on which to assess IUCN threat categories for these species. The relative rates of decline (e.g. 6% per decade for *Filago lutescens*; Rich & Karran 2006) can also be calculated to indicate conservation priorities.

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## County Roundup

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David Pearman (dpearman4@aol.com) & Alex Lockton (coordinator@bsbi.org.uk)

### Southern England

In **West Cornwall**, Colin French reports on a huge number of activities in the county, including a process of tackling a backlog of data, which has resulted in nearly 100,000 records being added to the New Erica database in 2007. This phenomenal level of computerisation can create problems, as Colin points out, in the way that data flows out of the local system into national and international databases. The key difficulty is in reconciling primary databases with compiled ones.

A primary database is an original collection of data – in this case field records collected by the Botanical Cornwall Group, where the Group itself has responsibility for the accuracy and maintenance of this data set. Like all databases, it is constantly changing by additions, deletions and corrections.

A compiled database is one which receives data from primary sources, but which does not itself have the responsibility for modifying the records. The Maps Scheme is a typical compiled database – all it holds is lists of tetrads compiled from hundreds of primary databases.

The most efficient way of working is to have a clear division between primary and compiled databases. Each county recorder, referee, museum and records centre should manage their own primary database, keeping it up to date and of high quality. The BSBI then, from time to time, compiles national maps from your databases.

That is not the way it has worked in the past, because the Vascular Plants Database (VPDB) is both a primary and a compiled database, with the two functions irreconcilably confused. However, moving towards a clearer system of primary and compiled databases is not a simple process, and it requires (among other things) all county recorders to be (a) capable and (b) willing to manage and share a comprehensive database. Half a dozen recorders have got to this stage already, but only that many out of maybe 200 primary databases that we draw upon. Colin suggests

that Cornwall has now got to that stage, and we would be happy to put this to the test.

Rosemary Parslow, on the **Isles of Scilly**, has had one of her wishes granted – at least as far as the Maps Scheme is concerned. We have now created a new vice county, No. 114, to replace 1b as the label for the Scilly Isles. This is how it is represented in the table of recording effort above.

Roger Smith reports that they held fourteen field meetings in **South Devon** in 2006 and added 40,000 records to their database. There was a planned *Sorbus* recording session at Watersmeet which seems to have been a great success, with 478 trees being recorded. However, this level of recording creates a whole set of problems of its own, and it is an issue that is beginning to affect more counties.

The situation arises with the use of GPS to record the location of individual plants within sites. Sometimes thousands of records are generated, all very similar but with grid references that vary by tiny amounts, or even not at all. Two whitebeams at Watersmeet, for instance, could be recorded in the same 1m square but generate different records because other factors such as the height and girth of the trees would be recorded separately.

Such detailed recording may be very useful for some purposes but not for others. For instance, it can be great for someone who is trying to find a plant again and wants to know where to look. But it is not so useful in measuring change in the number of trees in time – you can't simply count the number of dots on the map, because the GPS is not accurate enough to get the grid reference right every time. Ken Adams illustrated this point at a recent Recorders' Conference by using data on *Populus nigra*, where he showed that the same tree could easily be recorded in half a dozen different places, giving rise to the illusion that five trees had been cut down.

This is a classic issue of scale, familiar to all geographers and cartographers. What you record at one scale, for one purpose, can be very different to what you might record at another. Think about maps, and how a large scale map will show field boundaries, whereas

a small scale one might only show the major roads, exaggerated hugely in size so you can see them. More detail isn't always a good thing: you can't navigate on a long journey using 1:2,500 scale maps.

The solution to this problem has to be a process of holding data in various different ways. The local recorder might want precise localities of each tree, whereas the national database might prefer a count of the total number of trees in the site. This is one of the reasons why, ultimately, we can't have just one database that does everything. It is a matter of balancing the utility and accuracy of the recording we do against the cost and effort – a tricky balance. We shall hear a lot more about issues of size and scale over the coming years.

Another issue that Roger raises is the need for herbarium materials, which are prohibitively expensive to order in small quantities. His suggestion is that the BSBI should buy them in bulk and make them available to v.c. recorders. We should be able to do that, and we shall try to arrange a herbarium workshop with equipment supplies for the next Recorders' Conference. We have done this in the past, on request, providing materials such as glacial acetic acid. Would people please get in touch if they would find this useful, so we can gauge the likely scale of the demand?

Bob Hodgson, in **North Devon**, is busy working towards the new Fl. Devon with a lot of recording under way. Bob used the recording card that is available for downloading from the BSBI web site, and noticed that it didn't include some common saltmarsh species (which have a very restricted distribution in Devon). Quentin Groom (who produced the cards from the AUP database) happily added the missing species, and other county recorders might like to bear in mind that we can do this. The cards are for your use – you can have them modified any way you like.

Steve Parker and Helena Crouch report that a Rare Plant Register is the main recording activity in **Somerset** at the moment. They have received a copy of the tetrad Atlas data back from the Somerset Records Centre (500,000 records) and now the Bristol LRC has contributed its entire plants dataset, including the recent Flora of Bristol data

(another 300,000 records). All this is going into Mapmate to flesh out Date Class 3 and provide comprehensive tetrad coverage of the county.

The main event for Sharon Pilkington in Wiltshire in 2007 was the launch of her **Rare Plant Register**. Not only does she cover both v.c. 7 & 8 but she has also recently become the bryophyte recorder. Fortunately, there is a active team of botanists supporting her, including Richard Aisbitt, who also came to the Recorders' Conference last year. Sharon requested more workshops on identification of difficult groups at the conference; we shall try. It depends on the willingness of the referees, of course, as we don't pay them for their contribution, although we do waive the booking fee of course.

A plant group has been set up to help with recording in **Dorset**, and the LRC sent all its recent survey data, which has helped a lot with DC4 data. A common theme this year is just how useful LRCs can be. Successful ones these days understand that they need to support the naturalists' societies, and in return they receive a boost to their own recording and the goodwill of the community; which, ultimately, is the most important thing if they hope to continue to receive public funding.

Colin Pope reports on surveys of *Zostera*, pteridophytes and *Clinopodium menthifolium* on the **Isle of Wight**. A report on the latter appeared in the Proceedings of the Natural History and Archaeology Society, which shows how important it has been for this plant that its site is constantly and painstakingly cared for and gardened. Meanwhile Paul Stanley discovered a population of *Carex humilis*, new to the island, and Geoff Toone has been setting up a Mapmate network to enable all the recorders to exchange records and share them with the BSBI.

The recorders for **Hampshire**, Martin Rand and Tony Mundell, have signed a data exchange agreement with their LRC, which gives them access to the GIS at HBIC as well as the botanical records. Several recorders have expressed a desire to use GIS, and this is perhaps the most practical way to accomplish that. Work on the Rare Plant Register is well advanced and the rate of recording is very high. The Flora Group has a superb newsletter which is downloadable at

www.hantsplants.org.uk, which is a web site with many other interesting features, including a Rare Plants Register with full details of all records (but you have to apply to be given access to it).

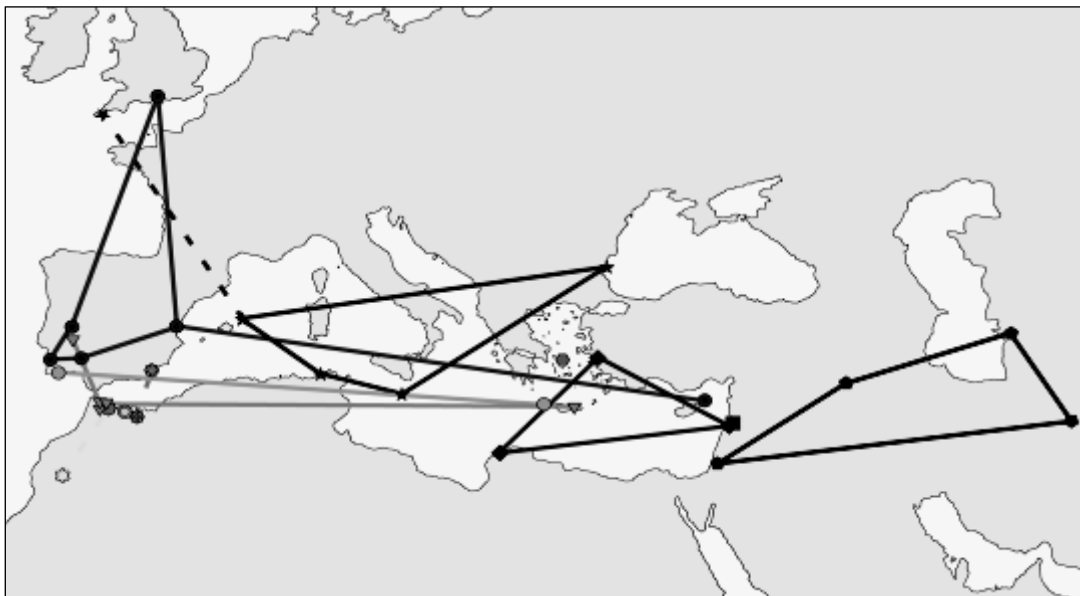
In 2007 Aeron Buchanan, a student of Fred Rumsey's, undertook a study of *Gladiolus illyricus* in an attempt to find out whether it really is native in the New Forest or not. He sequenced a stretch of DNA from plants collected in Britain and compared this with European plants in the herbarium of the University of Reading.

The hypothesis behind the study was that, if the gladiolus had arrived in Britain naturally many thousands of years ago, there would be a clear sequence from east to west, showing ever greater genetic differences. While, on the other hand, a recent arrival as a garden escape would be just as likely to be related to eastern Mediterranean plants as to its nearest neighbours in France or Spain.

species entirely and may be an anomalous result.

There is one interesting observation that can be made from this study, however. Although the relationships between the plants show a vague east-west transition, they do not show a north-south transition. Specifically, it seems to have migrated on *both sides of the Mediterranean Sea* simultaneously. This undermines the 'gradual migration' theory, and demands a long-distance dispersal mechanism. The question now becomes, therefore: 'is Wild Gladiolus dispersed by boats or by birds?' Another potential project for an MSc...

The **Sussex** recorders Alan Knapp, Mary Briggs and Paul Harmes, report that recording is progressing well towards their new Flora, the recording period for which is at the end of 2010 (although Paul says by 2010). Hopefully they will work hard for the next couple of years and finish in 2009, because that would bring them completely in line with the BSBI's



Relationships between gladiolus plants. Dots indicate the point of origin of each specimen, while lines drawn between them indicate closely-related groups. Map produced by Aeron Buchanan.

The results are shown in the figure below. Roughly speaking, 80% of the results broadly support the east-west migration theory, while 20% show long-distance dispersal. This is, unfortunately, quite inclusive, as that pattern of relationships could have been created by either model. The New Forest plants turned out to be identical to a single specimen from Crete – but that is supposed to be a different

Date Classes. Not that it matters very much, as long as all data goes into Mapmate, because the records can still be sorted into decades even if the Flora extends into DC5. Their January 2008 Newsletter shows that records have been received for almost every tetrad in the county now, although many squares have fewer than 100 species so far.

Interesting finds in Sussex include *Crassula tillaea*, which was previously thought to be extinct, and *Dianthus armeria* in two new locations. Paul mentions that he needs some new taxa added to the Mapmate species dictionary (such as *Poa infirma* × *annua*). To do this, simply get in touch with Bob Ellis, who regularly updates the Mapmate checklist.

Eric Philp reports that work on his (second!) tetrad Atlas of **Kent** is nearly finished, and adds a grumble about whether it is worth publishing when everything will be on the internet soon, anyway. Well the jury is still out over the issue of the permanence and use of internet publishing. Paper books are by no means redundant yet.

We are very grateful to receive copies of newsletters, which we keep at the BSBI Library in Shrewsbury. Ann Sankey sent the one for **Surrey** and reports that Foot & Mouth restrictions have been a problem in 2007, but recording has continued satisfactorily in unaffected parts of the county. The society has recently launched its own website: [surreyflora.org.uk](http://surreyflora.org.uk). Recorders who don't have large groups and access to resources like this might like to note that the BSBI can either host your web sites for you, for free, or we can create sites or pages for you. If you have a web site then you can advertise your services directly.

Trevor James sent his **Hertfordshire** Flora Group newsletter for the library and set out some ambitious plans for future work, which include getting his copy of Recorder 2002 into a usable state, to send his data to the NBN, and to establish a Hertfordshire web site which will use web services to link to the NBN Gateway.

In 2006 the **Buckinghamshire** LRC sent us their entire database of 500,000 plant records, which they keep on Mapmate. This includes many records by Roy Maycock – effectively functioning as his data managers. Another example of an excellent LRC. The LRC also organises an annual forum for recorders each year, with about 100 people attending, but even these attendance figures didn't stop them, collectively, grumbling about not having enough time or workers. There was a decision to set up a Rare Plants working group, and Roy says it will be interesting to see what transpires...

In 2006 the **Cambridgeshire** Flora Group announced plans to start work on a new Flora of the county. The plan is to go for what they describe as a novel approach, recording at 10km square level to save effort but focusing on ecological, historical and taxonomic issues instead. Members are urged to look up old published records and see if the plants are still there (apparently *Berberis vulgaris* is still present in four of its old sites) or to make a list for a 10km square or a parish.

Chris Boon draws our attention to the taxonomic splitting of *Centaurea nigra*, and comments on the first **Bedfordshire** record of Chalk Knapweed, *C. debeauxii*, at Totternhoe. He is working towards a new Flora of the county.

In **Northamptonshire**, Gill Gent & Rob Wilson report that they receive many requests from consultants, as there is intense development pressure. We concur – over the last couple of years, the majority of enquiries we receive from the BSBI web site (which are forwarded to county recorders) are about Northamptonshire and the west coast of Ireland. A Rare Plant Register is nearing completion, and otherwise the main activity is just surveying to keep the records up to date.

At the Recorder's Conference in September Stephanie Thomson retired as recorder for **Herefordshire** – a post which she had held for over thirty years. During this time she had organised a complete tetrad survey of the county (although our map showed one gap!), which is a considerable accomplishment. Peter Garner is the new recorder, and he is hoping to start seriously when he retires soon from his current job as a headmaster. Also active in the county is a group focused on the local record centre, which is run by Steve Roe with lots of help from Heather Webster and Clive Jermy, who are working on a rare plant register.

John Hawksford is gearing up for the publication of his **Flora of Staffordshire** in 2010, and meanwhile has been active in keeping his Rare Plant Register (which is available on the web site) up-to-date, and sending new records in for *Watsonia*. John asked for more notice of taxonomic workshops at the Recorders' Conference, as he didn't have time to collect *Taraxacum* for the 2006 one. Forward planning for the

conference is difficult – people don't like to be booked that far in advance, so the programme is often only finalised a month or so beforehand. But Bert Reid (*Taraxacum*), Roger Maskew (*Rosa*) and Alan Silverside (*Euphrasia*), often attend and are generally available to det. specimens, so do feel free to collect in anticipation.

In **Shropshire** a noteworthy event in 2007 was the reappearance of what we thought was the lost 1909 manuscript Flora of the county, which adds 2,100 pages of records of historical data. We also paid to have the Shrewsbury Museum and Shrewsbury School herbaria digitized (the latter by Herbaria at Home), which has resulted in new county records and many other valuable finds.

This means the county now has more Date Class 0 records (pre-1930) than DC2 (1930-1969), which shows how much difference it can make when the historical records are computerised.

Also in 2007 a Virtual Records Centre was set up with the Wildlife Trust, the County Council and Natural England. The partners share data and money, but each has their own distinct role. The Botanical Society validates records and manages the database, which is then made available to the others via a web site that allows, for example, Natural England staff to download a definitive list of all the axiophytes on any SSSI. This means that conservation staff can access the latest, most accurate information instantly and in full detail – for a fraction of the cost of running a traditional local records centre.

**W**ales  
Trevor Evans's Flora of **Monmouthshire** was published this year – a welcome addition to the list of recent Welsh Floras. The main emphasis is on finding and identifying plants, which is an old-fashioned approach, as most modern authors assume the ID guides cover this, and instead focus on analysis of their data; but there is still scope for tips on identification.

Those who attended the Recorders' Conference last year will have heard Richard Pryce describe the point recording system he uses in **Carmarthenshire**, which is an interesting approach to the issue of scale. He

writes 'other people fail to see the value of this, but in my view... you might as well record as accurately as you can.' In brief, Richard makes detailed target notes, based on the Phase 1 methodology that many consultants use (but obviously much more painstakingly than is generally done in the commercial sector). We certainly wouldn't criticise it, because we can always convert a detailed grid reference to a tetrad or a hectad, but not vice versa.

Stephen Evans sent some draft species accounts of his planned Rare Plant Register of **Pembrokeshire**. This is a publication that takes recording to a new extreme – every single plant of *Orchis morio* in the county is plotted on what amounts to a 1m grid overlain on aerial photographs, and every one is accompanied by a site photograph. And it is not even a rare species in that county.

It is fascinating to see the different approaches that people take toward recording. You couldn't get two more opposite positions than Stephen Evans's and Alan Leslie's (v.c. 29) proposals. One is fixated on space and the other on time. Both sound splendid, and it is a great strength of the BSBI that there is so much variation. Which turns out to be better is something we can only wait and see.

Arthur Chater is close to the completion of his Flora of **Cardiganshire**. The drafts of this are particularly promising, with detailed species accounts that include not just an unparalleled depth of taxonomy but also a wide breadth of local knowledge such as historical uses of plants in west Wales. Arthur is considering looking for a successor to take on the task of re-recording the county now that his Magnum Opus is almost completed.

On **Anglesey**, Ian Bonner and Nigel Brown have continued with an active programme of field meetings, recording all species on at least a 1km scale. The Rare Plant Register was published in 2006 – and a second edition is planned for 2008. Ian promises a list of axiophytes presently, and it is good to see that the emphasis on recording in this county is for conservation benefit. Several interesting finds of U1 *Rumex acetosella* grassland species such as *Cerastium arvense* and *Moenchia erecta* show that v.c. 52 has some of the most westerly examples of this vegetation type.

## Northern England

Paul Kirby reports that he is continuing to work through a backlog of data in **North Lincolnshire**, and grumbled slightly that funding for data entry (by a contractor) ceased at the end of 2006. Michael Jeeves, in **Leicestershire**, gave a talk on the work of the BSBI to other naturalists in the county and continued to work on his Rare Plant Register. Alan Willmot sent a copy of the **Derbyshire** Flora Group newsletter, with information about new finds in the county and progress with writing species accounts. The group has launched a web site with maps of the species that are to be included in the forthcoming Flora, with some species accounts and dates of first records. You can find this at [www.derby.gov.uk/flora](http://www.derby.gov.uk/flora).

Graeme Kay published his Rare Plant Register for **Cheshire** on the BSBI web site, and continued with routine recording. The newsletter details interesting finds such as a new site for *Carex divisa* and lots of *Cicuta virosa*.

Dave Earl reports that he has been compiling data in Mapmate from many sources, and now has some 600,000 records for **South Lancashire** all in the same database at last. He is aiming to get the draft of his planned Flora ready in 2008. It has a very wide taxonomic coverage, with many casuals, garden escapes and critical taxa included, so a CD will be included to prevent the book becoming unmanageably large. Eric Greenwood, in **North Lancashire**, is also nearing completion of his Flora, and has been checking up on rare species and – most importantly – Bowland, which was inaccessible to the public until land started being opened up under the CROW Act.

Eric is involved with species protection through the local Wildlife Trust, and laments the short list of species that are considered noteworthy under the Biodiversity Action Plan. However, he points out that it would be far too much work to maintain long lists of BAP species, with all the reporting and admin that this incurs. One solution to this is to make an axiophyte list and persuade the local authorities to recognise it as a 'long list' of local BAP species. Then the species don't all need individual statutory reporting, but they

can be used for conservation work. For example, you can create a policy that says that a site with at least 10 axiophytes/BAP species needs special consideration if anything is likely to affect it. All you need to do is produce a coincidence map and you can identify conservation hotspots and feed this information into the planning process. One interesting consequence of this is that local authorities are willing to pay good money to receive such information.

This is the first annual report from Vince Jones and Mike Yates, who have taken on **NE Yorkshire**. Their first task was to assemble all available data into Mapmate, which so far amounts to 167,000 records, including 128 new county records for publication in Watsonia. This still leaves half the county's tetrads with no records, however, and an ambitious new fieldwork project has been launched to bring it all up to date and improve coverage. Meanwhile, in **SW Yorkshire** Geoffrey Wilmore is nearing the final stages of his planned 'Plant Atlas' (which sounds more like a full Flora than simply an Atlas) and he has adopted the Maps Scheme with enthusiasm – with plans to immediately start resurveying the county to flesh out the Date Class 4 maps.

Phyl Abbott says that she likes reading about what the other county recorders are doing (thanks, Phyl!) and reports that some of her friends miss the fun of square bashing, now that her Flora is published. Phyl seems to be doing mostly site surveys at the moment, which help the Wildlife Trust and other organisations, as well as keeping the Maps Scheme going. The thing to say to the enthusiastic square-bashers, perhaps, is to help out in a neighbouring county, most of which seem to be working on Floras at the moment.

Deborah Millward decided last year (2007) to stand down as county recorder for **NW Yorkshire** after 12 years in the job, as she has too many other commitments and felt she couldn't dedicate enough time to the BSBI. Thanks are due to Deborah for her contribution, though, which – to judge from the AUP stats – was perfectly respectable.

In **South Northumberland** John Richards and Quentin Groom have been building up a group to help with recording – a necessary

thing if one of you happens to live in Belgium. This has involved compiling records from many sources and creating a web site for the group. Fieldwork has started for a Rare Plant Register, and there is a week-long BSBI field meeting planned for the county in 2008.

Chris Metherell started as joint recorder for **North Northumberland** in 2006. So far, he has drawn up a list of rare plants in the county and started resurveying them for a rare plant register. He also found that there were no records at all for 70 of the county's tetrads, so he surveyed 40 of those in 2007 and plans to visit each of the remaining ones this year.

Geoffrey Halliday found life in **Westmorland** and **Cumbria** to be much as usual – field and indoor meetings, databases, etc. He complains that there are no new, young recorders coming forward and asks ‘please, no new projects for a while!’ but that isn’t really fair. While some counties are in the declining phase, others are active and energetic. If the BSBI doesn’t run projects, then there certainly won’t be any new recorders.

## I sle of Man

After just two years in post, Linda Moore is leaving for a new job at the Gloucestershire Records Centre – for which, our congratulations. Linda’s report includes mention of problems with computers crashing and difficulties exporting data from Recorder 2002; hence the lack of any post-2000 date for v.c. 71 in the Maps Scheme.

## S cotland

David Hawker ran a field meeting in **Kirkcudbrightshire** in 2006 at which a new site for *Saussurea alpina* was discovered, and has plans to start compiling data on rare and scarce species. Peter Macpherson is currently targeting under-recorded corners of **Lanarkshire** and taking photographs for his forthcoming Flora.

In **Selkirkshire & Roxburghshire**, Rod Corner has been dealing with plans for afforestation, leading field meetings, and having his backlog of data computerised by Jim McIntosh’s team of inputters. He says that we are getting bad at making data (such as altitudinal limits) available in non-electronic formats, which is a fair point. The BSBI has benefited enormously by the creation of the

internet, and most of what we do now is entirely electronic. It is hard to imagine that this process could or should ever be reversed, so this is something people will just have to get used to. Our apologies to those who don’t always approve. Having said that, Rod is clearly one of the people who manage very well with the internet.

Michael Braithwaite sent an example of his planned new Rare Plant Register for **Berwickshire**, which is organised by site rather than by species, building on his success with the Site Flora of St. Abb’s Head. The most obvious problem with arranging an RPR by site is that there is not an obvious target audience. Site managers need to know about their ecologically important plants - the ones that indicate that their site is in favourable condition or not; whereas a list of rare plants will include oddities such as *Equisetum xitorale*, which is surely just a taxonomic curiosity. Perhaps a Rare Plant Register is not really what the conservation world needs from us; should we be producing Conservation Site Audits instead? Michael’s foray into this possible new field will be an interesting experiment.

In **Fife & Kinross**, George Ballantyne is writing up his planned Flora, but has been struggling with health problems. He has requested help with fieldwork, and mentions a surprising find of *Peucedanum palustre* by Barbara Hogarth.

Martin Robinson has embarked on an energetic exploration of **East Perthshire**, with lots of finds such as new sites for *Kobresia simpliciuscula*, *Saxifraga nivalis* and *Carex vaginata* and rediscovering a site for *Najas flexilis*.

An entertaining story from David Welch, in **Aberdeenshire**, is of the unfortunate consultants who misidentified *Carex pendula* as *C. rostrata* and then declared that its site must be drying out. Fortunately, the local authority seems more attuned to ecology than the experts they hired. Readers will have read in the news about the proposed Menie Dunes development, about which David says that conservationists are being consulted. A large population of *Carex maritima* was discovered here only after the development proposals were made, which illustrates why it is so

important to survey sites properly *before* they are scheduled for destruction.

**Banffshire** hasn't had a Flora since 1912, but Andy Amphlett has compiled as complete a database as possible, including all historical records back to 1806. He and Ian Green have boosted recording in the county in recent years, adding 24 species to the county list in 2007 and other interesting re-finds such as *Atriplex portulacoides* and *Allium vineale*. A data exchange agreement has been signed with the LRC, and Andy has agreed to validate all botanical records for them in future.

There is a section on the feedback form for complaints, and this is perhaps the most useful part of it. We hope Ian Green won't mind us repeating his comment that the BSBI doesn't always seem to appreciate its v.c. recorders adequately. When he retired as recorder for North Somerset no-one even said thank you for all the work he had done, and no-one seemed interested enough to ask him to hand over his records. To be fair, this was a rare oversight by Records Committee – we (David Pearman or, previously, David McCosh) have always written to retiring county recorders to thank them for their work. So our apologies to Ian for this mistake; however, we would welcome any ideas about the most appropriate ways to thank or reward v.c. recorders and others who give their time to the society.

Meanwhile, Ian has been active as the new recorder for **Moray**, and has contributed many of the new records for Banffshire through his work at the local records centre, and computerising data for other county recorders under contract to SNH, organised by Jim McIntosh. This year he is planning to start work on a Rare Plant Register; but he reports that the only interesting find in 2007 was a new population of *Carum verticillatum*.

In **Westernness** Ian Strachan has adopted monads as the main unit of recording, and has been to previously unrecorded islands using his new canoe. Ian has finally confirmed that there really are two sites for *Diapensia lapponica*, albeit just 1 km apart. Previous reports suggested that this might be the case, but we had not definite confirmation. Other significant recent finds include *Lycopodium lagopus* still present in the site where it was collected in 1896 and *Juncus filiformis* in

Glen Spean. Meanwhile, Ian Bonner records Ardnamurchan, also on a 1km scale, and has worked through the historical backlog of data with a little encouragement from an SNH grant.

In **Main Argyll**, Carl Farmer has been appointed joint recorder to help Gordon Rothero. Carl's previous involvement with the BSBI includes computerising over 50,000 paper records for v.c. 104 as part of the pilot computerisation project funded by SNH and Esmee Fairbairn Foundation. He has set his priorities as: organising the computerisation of the backlog of paper records, and to spend at least a day recording in each of the county's 60 hectads over the next two years so as to achieve reasonable coverage for the current date class

Malcolm Ogilvie has converted his database for the **South Ebudes** to Mapmate format and undertaken some orchid population monitoring by turning the interests of visiting botanists to good use. In the **Mid Ebudes**, Lynne Farrell reported on a BSBI field meeting in 2006, and has plans to continue as county recorder and work on her Flora now that she has retired to Cambridgeshire.

Stephen Bungard is writing a Flora of Raasay and Rona and getting to grips with tetrad recording on Skye. He says there is no way he could survey the whole of the **North Ebudes** every ten years, and suggested that 20 years is a more realistic time frame. This is a fair point – when you have many islands to deal with, and each of those islands has an inflated number of grid squares owing to the edge effect, it really is a lot more work than the total area of the county would seem to suggest. But that's not necessarily a problem to the Maps Scheme; we can always combine two date classes for under-recorded areas, or extrapolate between date classes for squares that have clearly not been recorded. The important point is to maintain an active cycle of recording, and to make sure that all records are properly localised in time & space. All of Stephen's records show at least tetrad and year, which is as much as we ask.

In **Easter Ross** Brian and Barbara Ballinger set themselves the target of getting to the two remote hectads that they haven't yet visited in the current date class, and they reported on their find of the hybrid *Ajuga*



<sup>x</sup>*pseudopyramidalis* as well as two new sites for a thing called *Anarta melanopa*.

Pat Evans gives an entertaining account of a day in **West Sutherland** spent checking out a reported sighting of a mystery *Lathyrus* which involved a ferry crossing, a bus trip, a two-hour walk across featureless moorland and then a few minutes to confirm the presence of the not-very-exciting *L. linifolius*. It's always difficult to know what to do when the public reports something interesting. The average success rate is probably less than 10%, but there is always a chance. On the other hand, a report of *Platanthera bifolia* as a result of an SNH campaign on this species turned out to be for the much rarer (in these parts) *P. chlorantha*, so perhaps that makes up for it, somewhat. Pat's next project is to be a Rare Plant Register.

Ken Butler is close to completing his Rare Plant Register of **Caithness**, which will include new sites for *Carex maritima* and *Calamagrostis stricta* that he discovered in 2007.

Richard Pankhurst and Paul Smith report that they are very happy with tetrad recording in the **Outer Hebrides**, and are pushing on with that towards a new Flora. They were pleased to receive a sand dune survey from SNH and a copy of the NVC database, which together added 15,000 records for the county.

## Channel Isles

**C**Brian Bonnard reports on a successful grid conversion process that seems to have resolved the notoriously difficult mapping issues that plague recording in **Alderney**, and the Channel Isles generally. It seems that GPSes now solve this, and Charles David, of the Guernsey LRC, has been using GIS wizardry to change the old records. If anyone wants the new map, they should buy a copy of Brian's book *The Wild Flowers of Alderney* from the Alderney Wildlife Trust.

Roger Veall reported on the first record in nearly fifty years for *Ballota nigra* in **Sark**, and on *Diplotaxis muralis* being added to the island list. He was less enthusiastic about plants of exotic trees such as *Metasequoia glyptostroboides* and *Taxodium distichum* in an apparent effort to make Sark more attractive to tourists.

## Ireland

**Ú**na Fitzpatrick is responsible for botanical recording at the new National Biodiversity Data Centre in Waterford. She attended the Recorders' Conference in Shrewsbury in 2007 and gave a quick review of the plans for the new centre. These include computerising 19,000 quadrats in order to advance phytosociological studies in the Republic. The BDC also has a project on invasive alien species, and the Irish Committee and Records Committee agreed to support this with any data the BSBI holds. The Biological Records Centre at Monks Wood has been asked to supply what they hold on the Vascular Plants Database.

Tom O'Mahony, in **Co. Cork**, was one of the best contributors of records to the Hybrids Project. Although Tom may not be all that well known in Britain, he is one of the few county recorders who is permitted to record just about any hybrids. It is sometimes a slightly delicate issue, trying to decide who is good enough to make records of difficult taxa. The solution has to be that it is up to recorders to demonstrate their ability, not up to the referees to disprove them. It seems somewhat counter-intuitive, but the rule is that all records can be considered unconfirmed until they are proven to be correct, not the other way round.

Paul Green has drawn up a list of axiophytes for **Co. Waterford**, which is now available on the BSBI web site. Paul's Flora is due to be published in 2008, both in book form and on the web – with the help of the people at the BDC. There have been various databases and collections of maps put on the web before, but will apparently be the first time anyone has put a complete county Flora on the internet. Congratulations to Ireland – this is possibly a world first.

In 2006 Sylvia Reynolds had the sort of contract that many recorders would be highly envious of – the Wildlife Service commissioned a survey of the rare and scarce plants of **Co. Limerick**. One of the commonest complaints of recorders is that they are so rarely asked for any information by conservation organisations; and on the rare occasions when they are, the request is usually 'hand over your data and we'll take it from

here.' The experience of being properly consulted is one to treasure.

Sylvia is also very kind about the Maps Scheme, complimenting us on the speed of processing data. That's much appreciated. The Maps Scheme was designed to be a service to recorders to enable you to display your data on national maps. It isn't a centralised system. Please feel free to send us small additions or deletions at your convenience.

Gerry Sharkey, from **Co. Mayo**, reported that he is looking forward to working with the new National Biodiversity Data Centre, given that data flow is so poor in much of Ireland at the moment. There does seem to be quite a lot of support for the principle of this; it will be interesting to see how it works out. He asked for all the records we hold for his county, which we sent straight away.

Ralph Forbes has produced a draft local BAP list for **Donegal**, and is using Mapmate for his data, which includes moths as well as plants. He was trying to put together checklists for the vice counties just at the time we were sending these out for error checking, which was a fortunate coincidence.

In 2007 the Northern Ireland Records Centre sent over 100,000 of John Harron's records for incorporation into the Maps Scheme. Cedar say they are happy to send us any records they hold on behalf of the county recorders, but they won't do so unless and until the recorder in question asks them to. This is the first electronic data set we have had from NI, and it was perfectly good quality data, except for a small error that turned unconfirmed records into confirmed ones. That is an easy mistake to make, though, and it happens all the time.

## Referees

**R** Bert Reid keeps the national *Taraxacum* database, which is the 'top copy' for all records of dandelions. County recorders should therefore make sure that their records make it into this national database (NB they do need to be supported by properly determined voucher specimens). Bert sends us copies of the database regularly, so please email me (Alex) if you would like to see what is recorded in your county.

Pat Acock received 15 specimens in 2006, including new sites for *Equisetum xwillmotii* and one for *E. xfont-queri*. He says he would be interested in having his own database for keeping records. We will happily help any referee who wants to do this – just email us to say, and we'll find the most appropriate system for you.

Hugh Dawson received just one specimen as general aquatics referee, but he has offered about a thousand records of river plants to the new Dorset Flora Group. He also asks what happened to the recent Site Condition Monitoring data of 220 SSSI lochs in Scotland. The answer seems to be that the only SCM data that is computerised systematically is the rare plant records; everything else remains in reports, from which it is hard to extract proper records. The reports are potentially available to us, though, and Jim McIntosh is hoping to make them available to v.c. recorders.

Alison Lean received no specimens of *Rhinanthus*, but was sent photographs of all the sheets at LIV. Unfortunately, this is one of the groups that cannot always be done from photographs, as the flowers need to be dissected. It would be interesting to know how many species fall into this category.

Michael Foley considers it important to have good specimens of *Orobanch* – badly pressed specimens and fuzzy photos are of little use. He was sent six determinations in 2006, and eight of *Carex* hybrids.

Clare O'Reilly says she receives mainly specimens of *Symphytum* 'Hidcote Pink' and would like to see more specimens of *S. asperum* to accompany the increasing number of records. She needs good-quality vouchers, and cannot provide determinations from photographs alone.

Roy Vickery is the referee for Folklore and Popular Names, and he writes slightly apologetically to question the relevance of such a post to the modern society. He has collected a huge amount of information over the last 25 years or so, and would like to make it available to members who are leading walks and would like interesting anecdotes to stimulate interest, or to Flora writers to make their species accounts a bit more varied.

Alison Rutherford (*Hedera*) says she has been very busy determining ivies, and is working on an illustrated guide to the naturalised taxa, because apparently there is much ignorance about these. Several hybrids have also recently been described. She says the referees deserve a 'wee trumpet blast' for their contributions to the work of the society, and we wholeheartedly agree. A challenge for us is how to do this appropriately. My personal preference is to not to shower you with sickly praise, but instead to show our appreciation through the work we do. Alison mentions Eric Clement as someone who does a lot for little overt praise; but what she doesn't necessarily know is that when Eric writes in with a request he gets a full response by return of post. That's probably better than a trumpet blast, but perhaps we need both occasionally.

David Allen says he's not officially *Rubus* recorder, but he referees a lot of specimens and has acted as honorary curator of the collection at BM for 30 years, and there are now over 100,000 vouchers there. His current focus is on Ireland, where Paul Green, Alan Leslie, Margaret Norton, Declan Doogue and Paul Hackney have been helping. David points out that the society could do more to formalise and support the recording of critical taxa. Hopefully, he will be interested in the recent formation of a Taxonomy Panel, which means that, for the first time in a long while, the BSBI will have a committee dedicated to systematics. If that works well, it has been mooted as a possibility that it could take over the coordination of the referees from Records Committee.

In his role as Medicinal Plants referee, David draws our attention to the book he co-authored in 2004, *Medicinal Plants in Folk Tradition: an Ethnobotany of Britain & Ireland*. In this he was helped by numerous BSBI members, most notably Sylvia Reynolds, Larch Garrad and Roy Vickery.

The referee for *Erica*, *Calluna* and *Daboecia*, Charles Nelson, says he only received one specimen for determination in 2006, and that was a *Vaccinium*. He is keen to point out that he is not willing to become referee for that genus...

Rodney Burton also only received one specimen in 2006, and that was for a possible plant of a new subspecies of *Galium aparine*

(ssp. *agreste* P.D. Sell) that is described in Sell & Murrell's new Flora. Rodney is hoping to find this subspecies for himself and see if it comes true from seed.

Yet another referee who received only one specimen was Michael Braithwaite, who was shown a plant of *Trichophorum cespitosum* ssp. *germanicum*: not an exciting year. At one point there was a flurry of findings of the northern subspecies, but this seems to have dried up. Recorders need to be very careful now, because in the new *Cyperaceae* Handbook *T. cespitosum* refers to the rare, northern plant, whereas the common one is now *T. germanicum*. There is a lot of potential for error when a name is effectively re-used like this. Please note that the official BSBI list and the Maps Scheme still use the old names.

John Poland is referee for plants in a vegetative state. He was sent 100 specimens in 2007 (125 in 2006) and says he now needs to expand his repertoire to include more aliens and garden plants, as this is what he keep getting. He laments to modern craze of sending digital photographs, which don't allow him to use many of his identification techniques, such as examining the positions of stomata or vascular bundles...

Nick Stewart sends a reminder that his charophyte atlas is due out in 2008, but there is still time to send in any additional records or specimens that may be knocking around...

## Herbaria

Over the last couple of years John Hewitt has databased the 1,800 specimens collected by Richard Palmer and Walter Scott in Shetland between 1955 and 1987. The SLBI also has W.H. Beeby's 19<sup>th</sup> century Northern Isles herbarium within its 150,000 sheet collection, so there is a lot yet to be done there. It was a good idea to pick a discrete part of the herbarium to computerise, because it makes for a manageable task rather than an open-ended project.

The great success story of the last year or two has been the Herbaria at Home Project, set up by Tom Humphrey and Leander Wolstenholme. It has been popular with our recorders, partly because they can choose to be notified whenever a new specimen for their county is databased. It is a highly cost-

effective and efficient way to document herbaria which also produces much better quality data. The rate of digitization has been increasing as long as the project has been going, and is now running at about 10,000 sheets a year. To date, Aberystwyth, Shrewsbury School and Launceston Museum have been completely digitized, and there are many sheets from Manchester Museum and other major herbaria. The main project planned for this year is Birmingham University (BIRM), which will be by far the biggest collection yet attempted. Its collection spans the whole of the British Isles, so it is likely to have something of interest to everyone.

All county recorders and referees should have a look at Herbaria at Home if they haven't yet. For the more technophobic amongst us, it is a user-friendly introduction to some of the more powerful uses of the internet, and by exploring the site you will find out about message boards, watch lists, a wiki and you can even create your own avatar. We would like to thank all the people who have logged on and digitized sheets – the information is much appreciated by the recorders who want to make use of it.

## News from the NHM

Mark Spencer

After a long delay, we have finally been able to arrange Approved Borrower status for the BSBI. This means that BSBI Recorders and Referees will be able to receive loans at their home address from the Natural History Museum (BM). This should enable both Recorders and Referees to gain easier access to the Museum's very large collections of British (and European) plants; many of these collections are poorly known and remain unreported in county flora's and monographic works, as such they can provide valuable information that has previously been overlooked. If you are interested in receiving a loan or would like further information please contact: Mark Spencer, Curator, British & European Herbariums. Tel. 020 7942 5787 or e-mail: m.spencer@nhm.ac.uk

Following work contributing to the Hybrid's project our BSBI-supported volunteer, Alison Lean, will be undertaking further work databasing our holdings of UK Red-listed taxa. Recently completed databasing (undertaken by Alison and others) of the Museum's British collections include: *Agrostemma githago*, *Ajuga genevensis*, *Carex maritima*, *Cephalanthera rubra*, *Galeopsis segetum*, *Holosteum umbellatum*, *Melampyrum sylvaticum*, *Pinguicula alpina*, *Spiranthes aestivalis*, *Tephrosieris palustris* and *Trichophorum alpinum*. We are aiming to complete *Arnoseris minima*, *Gentianella anglica*, *Otanthus maritimus* and *Saxifraga hirculus* in the near future. To complete this work we need the help of volunteers to prepare, mount and conserve our herbarium specimens; if you are interested, or know someone who may be, please contact me. We are also looking for further volunteers to help Alison with the data-basing.

The Museum has for the last 3 years been undertaking extensive research into the taxonomy of Bluebells, both in the British Isles and on the continent, particularly Spain & Portugal. Much of the resulting data has proved fascinating and we aim to publish our key findings within the next 18 months. In the meantime we would like the assistance of BSBI Recorders as we need to collect further material from the British Isles. We would greatly appreciate the assistance of Recorders who have the time to collect Bluebell specimens from sites within their vice counties. What we need are:

- 5 specimens of *H. non-scripta*
- 5 specimens of *H. x massartiana*
- 5 specimens of *H. hispanica*

Ideally we would prefer it if they can be collected from one site but this may not be entirely practical in all circumstances. We are also aware that many people find deciding in the field whether material is hybrid or Spanish to be very difficult, don't worry we do too! If you are interested in helping the NHM with this project please contact me and I can provide you with further information and guidance.