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EDITORIAL

This issue is devoted to botanical recording. Such recording takes many forms. Our first article (8 sides), to which a number of members have contributed, describes the various forms of recording which have occurred in Wiltshire and discusses some of the isues arising. It is hoped that this will reinforce members' vision of their activities as part of a wider picture with value both culturally and as an aid to wildlife conservation.

Wiltshire Botanical Society owes its origin to plant recording. It was formed in 1992 to help people who had recorded for the 1993 Wiltshire Flora to continue their interest and pursue further recording. Though their recording has been less systematic than it was for the Flora, species found on Society outdoor meetings have been listed and members and others have sent individual records to a co-ordinator or to the vice-county recorders. The vice-county recorders have checked them and the coordinator has entered them on to a computer from 1993 onwards. So far, each issue of the journal has included a selection of the most interesting records for a particular year or years. In this issue they are for the year 2000 (?4 or 5 sides).

Of particular interest are records of rare species, and two articles illustrate its importance. Tim Rich and Andy Mc Veigh (2 sides) describe their rediscovery of Gentianella germanica, long believed extinct in Wiltshire, in its initial location, while Michael Williams (1 side) clarifies the location of an old site for Salvia pratensis, to help anyone trying to refind it. Some projects concern themselves with particular categories as plants, as does Jane Banks (4 sides), who describes the recording of rare arable weeds in the County.

Another interesting development is the recording of particular plant communities, usually in a particular site or range of sites. Louise Denning's first article (7 0r 8 sides) describes such a process for the Wiltshire Wildlife Trust's reserve at Morgan's Hill. Her second article (4 sides) exemplifies the increasing trend to focus recording on the ecology of plants as well as their distribution and community associates - in this case in relation to the Morgan's Hill orchids.

Good recording needs accurate identification, and John Presland's second set of keys for identifying Wiltshire crucifers (5 sides) is intended to help this process.

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BOTANICAL RECORDING IN WILTSHIRE

John Presland, with contributions from Richard Aisbitt, Dave Green, Malcom Hardcastle and Ann Hutchison

History

The history of botany in Wiltshire perhaps begins with John Aubrey's *The Natural History of Wiltshire* in 1847. Unfortunately, he had no specialised botanical knowledge and little familiarity with the work of leading botanists of his day, so that the work has been described as "a curious medley of observations on a great diversity of matters" (Grose 1957). Nevertheless, he mentioned 73 species of plant (Grigson 1957).

It was not until the 19th century that the first systematic treatment of the distribution of Wiltshire species (Flower 1857-1874) was published. Flower provided, for each species, a description, flowering and fruiting times, whether native, naturalised or intro- duced, the types of habitat occupied and the districts (out of 5 demarcated by major transport routes) in which it occurred. However, the flora of some parts of the county was very little covered.

Something like the whole county was eventually covered by Preston (1888). He divided the county into 11 districts based on river drainage systems and noted the districts in which each known plant occurred. Similar details to those of Flower were provided, and, additionally, the names and arrangement of species were based on those of recognised authorities, varieties were recognised, and he gave the date and recorder for the first county record of each species.

In 1852, a scheme by H C Watson divided the whole country into 112 vice-counties for recording purposes. Wiltshire was divided into Vice-county 7 in the north and Vice-county 8 in the south, with the Kennet and Avon Canal as the boundary between the two. However, it was not until the 1930s that vice-county recorders were appointed (by the Botanical Exchange Club) to take responsibility for recording in these areas. (Allen 2002). Even then the system had to be revitalised by the present Botanical Society of the British Isles (BSBI) after its formation in 1946. The BSBI also set up the current system of referees for identifying plants in critical groups a few years later.

The first modern flora of Wiltshire was that of Donald Grose (1957). He reordered Preston's districts into 10 to make them fit the vice-counties and recorded in all of them. The treatment of species showed most of the features that are found in county floras today. The nomenclature and order of species followed patterns established by leading botanists. Hybrids and colour variants were recognized. The status of plants was given *ie* whether they were natives, denizens, colonists, aliens or casuals. The habitats in which they grew were identified, as was

their frequency of occurrence, with clear criteria for the terms “common” and “frequent” based on the number of occurrences per 10 square miles. Records were allocated to vice-counties and to botanical districts and also identified by map references where appropriate. The recorders were noted and dates, herbarium specimens and confirmation of identification by experts referred to where relevant. Historical data on the occurrence of a species was quoted specifically. In his preparatory recording work, which took place between 1942 and 1954, he made systematic use of record cards, maintained his own herbarium and made habitat species lists in over 5,000 representative locations across the county (Hutchison 1993). These lists were the basis of the second section of his flora, a detailed account of the plant communities found in all the main types of habitat in the county. In this respect, it was one of the first British county floras to include a systematic ecological section. Records after Grose’s flora were published annually and eventually gathered together into a supplement (Stearn 1975).

The current flora

Grose’s achievement was immense, but his recording and record compilation was undertaken almost entirely by him and his wife May alone, with a small committee helping with the publication process only towards the end. Furthermore, much changed over the years and in the 1980s the opportunity arose both to update Grose’s account and to improve the process through changes in knowledge and through modern technology, aided by a large number of people to record plants and handle the data. Access also became available to the large and immensely important Salisbury Plain Training Area, which Grose had not been able to visit. The work, entitled the *Wiltshire Flora Mapping Project*, began in 1983 and was initiated and overseen by the Wiltshire Natural History Forum, a body formed in 1974 to improve liaison and cooperation amongst voluntary and statutory organisations concerned with natural history and conservation. Data handlers were able to make use of computers through the involvement of the Wiltshire Biological Records Centre (WBRC), set up in 1975, dormant by 1979, but revived in 1983.

The project was run by a steering group in which the main influence came from the two vice-county recorders. For recording purposes, species were divided into three categories, each with a different recording system on cards of distinctive colour, as follows:

- Common (A) - These were numbered on cards in alphabetical order of Latin name, with one card per tetrad (group of 4 kilometre squares of the National Grid). Recorders marked the card for a species if they saw it anywhere in the tetrad.
- Intermediate (B) - The card was as for A, except that there was a box by each species with four divisions, one for each kilometre square. Each square was marked if the species was observed within it.
- Rare (C) - Each species had its own card or cards for each 10 kilometre square. Each occurrence required a six-figure grid reference and notes on habitat and frequency.

Each 10 kilometre square had a coordinator who, from 1984 onwards, allocated cards to a team of recorders and retrieved them annually for records to be entered at the records centre until the tetrad was completed. Later there were field meetings to look at tetrads not covered. Recorders were given help with identification by more experienced botanists at both field and indoor meetings. The vice-county recorders checked C species carefully and sent specimens of some of them to national referees, in an effort to ensure accurate identification. Altogether, 260 people were involved in recording, which continued until 1991. The records centre staff entered the records into a *dBase III+* database on the computer and distribution maps were prepared from it.

The results were used to write *The Wiltshire Flora* (Gillam, Green and Hutchison 1993). The information provided on species was similar to that in Grose, with a few refinements. The nomenclature and order of species followed patterns established by leading botanists. Hybrids, subspecies and varieties were recognized. The status of plants was dealt with by noting as appropriate whether they were native to Wiltshire, native to Great Britain but an introduction in Wiltshire, an introduction in Great Britain, qualifying as *Nationally Scarce* Species (occurring in 16-100 10 kilometre squares in Great Britain) or *Red Data Book* species (15 or fewer 10 kilometre squares). The habitats in which they grew were identified, as was their frequency and distribution within each vice-county. The numbers and percentages of 10 kilometre squares and either 1 kilometre squares or 2 kilometre squares in which each species occurred was noted. Distribution maps were included for over half the species and, for others, geographical locations and identities of recorders. Historical data were noted in some cases. The least frequent non-natives were simply listed in an appendix. There were also articles on the geography, geology and habitats of the County, the history of its botanical recording and monographs on selected species of particular interest.

Atlas 2000

In the 1990s, recording was much influenced by the *Atlas 2000* project (Pearman and Preston 1996). Led by the BSBI in collaboration with the Institute of

Terrestrial Ecology (ITE), it aimed to provide a comprehensive atlas, with dot maps showing the distribution of species and hybrids in 10 kilometre squares in the whole of Britain and Ireland. It will supersede and include the 1962 *Atlas of the British Flora* (Perring and Walters 1962). All species and hybrids of vascular plants will be included, apart from such difficult genera as *Hieracium, Rubus and Taraxacum*. It will draw heavily upon the records from a variety of other recent national recording projects, such as the *BSBI Monitoring Scheme* (Rich 1996), set up in 1987 to assess the status of the flora in 1987-8 and provide a means of monitoring changes in the future. The data from the latter scheme are already entered into the *Vascular Plant Database* of the national Biological Records Centre (BRC) at the ITE (Branson 1990). Recording for *Atlas 2000* has concentrated on areas where there were inadequate records from the monitoring scheme. The data is being entered into the same database, which is known as *Recorder*. Recording continued until late 1999, and publication is expected in the near future.

The 1993 Wiltshire Flora records were accepted as sufficient for the county's contribution to *Atlas 2000*, except that certain areas were under-recorded. Members of Wiltshire Botanical Society made records in these areas. Recorders had to note the presence in each 10 kilometre square of any of a long list provided of species, aggregates of confusing groups of species, subspecies and hybrids. For rare, critical and and other species and subdivisions within species not included in the list, they had to note, for each, the location, habitat, six-figure grid reference, tetrad, vice-county, date, name of recorder and "other details". The data were entered on to a database called *Biobase*, and sent on discs to the Wiltshire Biological Records Centre, which in 1998 became the Wiltshire and Swindon Biological Records Centre (WSBRC). There, the data, together with the *Wiltshire Flora Mapping Project* data on *dBase 3+*, were converted into a form compatible with *Recorder*, the *Atlas 2000* database. They were then sent to the BRC for incorporation into the Atlas.

Further individual species recording by Wiltshire Botanical Society

Recording in Wiltshire since the 1993 Flora has been carried out by a number of bodies and taken a variety of forms. It includes that of the Wiltshire Botanical Society (WBS), formed in 1992 to help *Wiltshire Flora Mapping Project* recorders to continue their interest and pursue further recording. The Society has its own system for individual species records. Recording has not been systematic, but species found on Society outdoor meetings have been listed and members and others have sent individual records to a co-ordinator or to the vice-county recorders. The vice-county recorders have checked them and the coordinator has entered them on to a computer from 1993 onwards, earlier records being only on cards. The computer programme used has gone through various changes. For 1993 records, *Microsoft Works Version 3* was used, and for 1994 and 1995 a *Microsoft EXCEL* spreadsheet. With the advent of the *Atlas 2000* project, the *Biobase* database was used (for 1996 to 1999), since it was the system WSBRC was using for the project. The system was not geared to the Society's needs, because means could not be found of printing out the information as required for publication of records in *Wiltshire Botany* and there was no provision for some of the details the Society wanted to include, so the 1999 records were also entered into *EXCEL*. With a change of coordinator, the 2000 records and all earlier records were combined into a *Microsoft ACCESS* database. This provides for entry of all required data, enables systematic searches to be carried out (*eg* to find all the records of a particular species or all the species recorded in a particular kilometre square of the National Grid) and allows all necessary printouts.

A subcommittee looking at the whole approach in 2001 has decided that all records will now normally be sent to the coordinator, who will forward them to the vice-county recorders for checking and enter them into the database. A guide has been written for members (Aisbitt et al 2002) which asks them to include the following information for each record:

- botanical name,
- name of recorder,
- date,
- map reference (six-figure if possible, otherwise a four-figure map reference or the tetrad *(ie* 2 kilometre square) in which it occurs,
- vice-county,
- nearest village or town,
- details of where it's growing, type of habitat, numbers, and other notes of interest.

Feedback to members takes various forms. The coordinator can provide information on request on such topics as where particular plants can be found or what can be seen in a particular part of the county. The vice-county recorders can offer botanical information of a more technical kind. A selection of items of particular interest from each year's records from 1995 to 2000 has been published in *Wiltshire Botany* and it is planned to continue this. Articles based on Wiltshire plant records are also published, both in *Wiltshire Botany* and in the Society's Newsletter.

Other recording by Wiltshire Botanical Society

Members have not restricted themselves to mapping the distribution of vascular plants on the national grid and by vice-county. Stern (1999) has extended the range of coverage of species mapped by working on a bryophyte atlas for Vice-county 8 which is due for publication soon. The Society holds an annual fungus foray and records species found. Green (1997) studied the distribution of Black Poplar in Wiltshire and liaised with a national project on it. Randall (2000; 2001) produced what was, in effect, the first bramble flora for the county. Asters, Sainfoin on Salisbury Plain, stinging nettles, daisy hybrids, and Meadow Saffron have also been studied. Several members have taken part in Plantlife's project to map *Gentianella anglica*.

WBS members have also organised and carried out recording projects with a different emphasis entirely, in that they are primarily concerned with a particular species or group of species or of plant communities at particular sites or in particular types of habitat. One survey concerned with a group of species is WBS' contribution to the RSPB survey of rare arable weeds in the county (Banks 2002). Thirty sites with good potential for arable plants were visited by members in 1999. Twenty three priority species were identified, and 20 of these were surveyed. It was found that 17 are declining in Wiltshire and 3 are increasing. A number of new species were found. Another example is a survey of ancient trees, making use of the *Tree Register of the British Isles* and liaising with English Nature, who are looking at ways of computerising information about veteran trees and with Wiltshire Wildlife Trust, who are carrying out an *Ancient Tree Survey* in the Swindon and Braydon Forest area. Features and the condition of the trees are being recorded as well as distribution data. In another project, members have been recording unusual heights reached by particular plants.

Work by WBS members on individual sites or geographical areas are represented by that of Last (2000; 2001), who systematically recorded the plants in her home village of Berwick St James, and by two Society meetings in 1999 to record the plants growing at the Seven Fields Conservation Area in Swindon at the request of the group responsible for it. The Society has also carried out much of the recording for the *County Wildlife Sites Project* (also known as the *Habitat Survey)* run by Wiltshire Wildlife Trust (WWT) and also involving the national body English Nature. The aim is to identify *Sites of Potential Nature Conservation Interest (SNCIs)* and to survey them in such a way that all interested organisations would have access to unbiased and independent assessment of sites under planning application which are not protected by *SSSI* status (*ie* designated under Act of Parliament as a *Site of Special Scientific Interest*). The project started around 1993, and by 1998 over 300 valuable wildlife sites had been visited and the WWT was working with landowners to promote their continued management for nature conservation.

Work on particular habitat types has included a road verge survey jointly with WWT and Wiltshire County Council, monitoring of protected verges, surveying the flora of Wiltshire rivers (Oliver 1998; 1999) and recording for a churchyard survey.

Recording by other bodies

Recording in Wiltshire is also carried out by or on behalf of other bodies. Locally, this usually means Wiltshire Wildlife Trust (WWT), while the main national bodies are English Nature (EN) and the Institute of Terrestrial Ecology (ITE), the two organisations which have replaced the former Nature Conservancy Council. Such recording is usually primarily concerned with plant communities at particular sites or in particular types of habitat, rather than with mapping the distribution of plants on the national grid and by vice-county. However, both WWT, through its Wiltshire and Swindon Biological Records Centre (WSBRC), and ITE, through its national Biological Records Centre (BRC) coordinate recording of this kind by others and organise the information on databases. Nor should the distinction be regarded as absolute for the projects themselves - updating the distribution of Bath Asparagus has been a recent interest of WWT, while their *Ancient Tree Survey* has been referred to earlier.

WWT records plants on its reserves and on a range of other sites of botanical importance. A recent example is the survey of the reserve at Morgan's Hill (Denning 2002a), which mapped the whole area in terms of the *National Vegetation Classification* (Rodwell 1991; 1992). For example, two areas were found to be dominated by *Festuca ovina-Avenula pratensis* grass- land (Category *CG2* in the national classification), which means it was dominated by these two grasses - Sheep's Fescue and Meadow Oat-grass respectively. The results enabled the detection of changes which had occurred since a similar earlier study carried out by the Trust (de Lemos 1989). The study also recorded the occurrence and frequency of orchids in a particular area, noting particularly the direction in which the slope each plant grew on was facing (Denning 2002b). The aims of such studies are primarily to ensure that the sites are known about, monitored and protected. The last process requires evidence.

WWT has also organised surveys of particular categories of habitat within the county, including a

pond survey, and the *County Wildlife Sites Project* already described. In 1999, it introduced the *Wildlife Mapping Project*, in which volunteers undertake ecological classification of land within their community in order to identify areas worthy of more detailed study.

WWT also carries out surveys for other organisations, both public and private. For instance, it did this for a site which Winsley Parish Council had adopted as a nature reserve. It surveyed ancient woodlands for owners to help them submit *Woodland Grant Scheme* applications to the Forestry Commisssion.

WWT maintains the WSBRC, which receives records from many sources, though it cannot process them all. The differing ways in which information is stored and retrieved can also cause difficulties for any attempt at comprehensive provision. For individual records, it asks for similar information to that noted above as required by WBS and it publishes summaries of records at intervals (Wiltshire and Swindon Biological Records Centre 1999 for both).

Recording by or on behalf of national bodies has included the ITE ecological survey of the Salisbury Plain Training Area in 1996-7 (Walker and Pywell 2000). The whole area was mapped by identifying homogeneous stands of vegetation and assigning to each of them a plant community category from the *National Vegetation Classification*. Individual species were also recorded within each community type, the presence of rare or otherwise notable plants being highlighted. An example of English Nature's involvement is the survey they commissioned of the area of the New Forest which lies in the south-eastern corner of Wiltshire, again using the *National Vegetation Classification* (Wilson 1997).

Other national bodies are also sometimes involved. Plantlife's project to map *Gentianella anglica* and RSPB's arable weed project have already been mentioned. The Countryside Commission's *Country-side Stewardship Scheme* is another example. This involves withdrawing certain areas of land from arable farming and monitoring the changes. (Wilson 1993). Recording of fungi is the province of the British Mycological Society and a fungus flora of Wiltshire is in preparation (Shorten 2001).

In addition, surveys are also carried out or commiss-ioned by private individuals or bodies, though the data may not be easily accessible. A register of aberrant forms of native plants has been set up by Martin Cragg-Barber (1993). Self-employed ecological con- sultants carry out surveys for bodies and individuals wanting to know the wildlife status of land which they own or in which they have an interest.

Records from many of these sources are either sent to or are available to the Wiltshire Biological Records Centre.

Issues

Recording is the subject of continual debate in the botanical world. In particular, we need to think carefully about why we record, what we record, how we record and how we store the resulting information. These issues are discussed briefly below.

Why do we record?

WWT sources have identified a number of practical reasons for recording plants and plant communities (Mantle and Power 1997; Scott-White 1999). Firstly, it is an aid to nature conservation. WWT itself needs data to inform management decisions on its reserves. Planners need to know where the best sites are when deciding on planning applications and drawing up future development plans. WSBRC checks all planning applications throughout the county for their impact on wildlife including those species protected by the law. Consultants, often acting for developers, need data for environmental assessments. The local information collected by WWT complements data collection elsewhere to provide an indication of the nation's biodiversity heritage. This helps bodies such as the Environment Agency who are required to take wildlife into consideration in their plans and projects and need data for evidence and arguments. The data also have cultural importance. Students and local natural history societies, for instance, request information relating to their interests and projects. Furthermore, from both planning and cultural viewpoints, it is important to inform and influence the general public and to ensure that future generations will have access to adequate levels of information.

WBS has an important role in supporting the above roles of statutory bodies and their work should be informed by the same purposes. In particular, however, members are pursuing this work as a leisure interest and an important purpose of recording is to share their findings with people with common interests, just for the joy of it.

What should be recorded?

Rich (2000) offers an overall picture of what we should be doing. He begins by suggesting that the next fifteen years be spent on local projects including work towards a Red Data Book 2010 to identify the

species most under threat of extinction, and then begin work for an Atlas 2015-2025 with standardised recording. County floras will continue to be written, but should be mainly for counties which have not had one for about 25 years. Elsewhere, it would be better to concentrate on smaller, largely site-specific projects, preferably co-ordinated nationally or involving several counties and using standardised procedures. Species surveys should be another priority, particularly of the rarest species and critical groups like *Hieracium* and *Rubus* and both nationally and locally, and this may lead to study of the plants' ecology. Monitoring projects, studying change in species or communities over a long period, are also important. Study of historical records, both in books and in herbaria is a much neglected area which also needs much attention.

Wiltshire might well subscribe to Rich's priorities. WWT has already moved in this direction. It's projects are increasingly site specific. Though its WSBRC still receives records of individual species from a variety of sources, it cannot cope with everything. In 1996, Scott-White (1995) stated that the centre would concentrate on records of species which were indicator species of particular habitats, new vice-county records, refinds of Grose's records and records from *SSSI*s.

For WBS, Hardstaff (1994) suggested that priorities might be uncommon species for which there is no published distribution map, particularly if a locality is thought to be new, new tetrad records, and species not recorded for some years. WBS Science Group concluded (Kilgallen 1998) that the relocation of old records and counting of their numbers would be a valuable role for the Society. Appendix 4 of the 1993 Flora could be helpful here. It would also be useful to visit sites of rarities on a regular basis and carry out more detailed monitoring in some cases. Green's (1998) *Wiltshire Vascular Plants County Red Data Book* would form a useful basis for such a project, though it would need updating in the light of a new edition of the national *Red Data Book* (Wigginton 1999). This defines all the plants in Great Britain which occur in 1-15 ten kilometre squares or are otherwise very rare or threatened. Wiltshire plants included in this publication are *Adonis annua, Arabis glabra, Carex filiformis, Centaurea cyanus, Cirsium tuberosum, Dianthus armeria, Galium constrictum, Leucojum aestivum ssp aestivum, Melampyrum arvense, Potamogeton nodosus, Rosa agrestis, Salvia pratensis* and *Valerianella rimosa.*

How shall we record?

Recording areas. Nationally, recording is mainly in terms of 10 kilometre squares, and Wiltshire recorders will no doubt work in this way when collaborating with national projects. However, this approach has its limitations. Pearman (1997) casts doubt on its validity for defining scarce and *Red Data Book* plants and argues that more fine-grained data should be used. Local recorders would be well advised to continue recording in terms of tetrads or kilometre squares and noting six-figure grid references and other specific information, at least for rarer species.

Accuracy and consistency. Particular attention needs to be focused on ensuring accuracy of records. Lockton's (2000) analysis of a number of major botanical databases shows that up to 40% of all records are likely to be incorrect in some significant way (*eg* wrong 10 kilometre square, wrong date, wrong species). He points out that there's no published or standard procedure for rejecting records and it would be difficult to devise one. It won't do, for instance, to reject a record because it's outside the normal range of the plant - such records will sometimes be right. As a general rule, however, the recorder should have to prove that the identification is correct. Associated with accuracy is inconsistency. Two studies by Rich and colleagues (Rich 1998; Rich and Smith 1996; Rich and Woodruff 1992) found that botanical recording could be seriously biased by the behaviour of individual recorders. Different botanists differed in the number of species found in the same area despite having received the same instructions. The more recording was done in an area the less likely this was to occur. There were significant variations in relation to: critical, within-species, hybrid and other difficult taxonomic categories; aliens, casuals, garden escapes, forestry trees, crops and deliberately introduced plants; areas visited only briefly by few botanists; areas where access is difficult; inconspicuous plants; rare plants; species characteristic of the beginning or end of the season; the intensity of recording; and differences of taxonomic knowledge or opinion.

Improving the quality of recording. Rich and his colleagues recommended the following measures to improve the quality of recording by volunteers:

- improve recording ability by training in identification and recording and by contact with other botanists;
- encourage recorders to visit many different areas rather than concentrate on one;
- try to encourage even coverage by recording for the same number of hours or having the same number of visits in each tetrad;
- visit as many habitats as possible in each square;
- ensure adequate seasonal coverage.

These are all measures which Wiltshire recorders and organisers could consider alongside the contents of WBS' guide to recording.

Collection of specimens for identification or verification by experts is an important issue in the quest for accuracy. Experts do need details to work from, but collecting specimens puts rare plants at risk. Wagner (2000) offers "the 1 in 20 rule". Count 20 plants before taking a specimen and another 20 before you take a second. The same applies, proportionately, to collecting parts of plants - no more than 5% of a shrub, one fern frond from a clump of twenty, 5% of a patch of moss, 5% of the seeds, etc. The rule should not be used as a licence to take specimens under all circumstances - careful field notes and photographs are sometimes sufficient for validating an identification.

Native or alien status is a controversial area. A BSBI subcommittee (Macpherson et al 1996) defined a native plant as one which which originally evolved here or has arrived, entirely independently of human activity, from an area in which it is native. An alien, therefore, is a plant that has arrived through the activities of humans or independently of human activity but from an area in which it is alien. The distinction, it appears, cannot be made without referring back in many cases to an earlier environment. It cannot always be made there either, because there may need to be referral back to a yet earlier environment - and so on. So it's not really a definition at all. Such attempts at definition also highlight the arbitrary nature of such distinctions. What difference is there in principle between a seed arriving on the wings of a migrant bird and one arriving accidentally on the trousers of a tourist? Is a plant arriving from South America on floating vegetation carried by the Gulf Stream a native, while one coming from northern France on a traveller's trousers is an alien? Further, one might even ask, since humans are a part of nature and part of human nature is to move things about, why should even a deliberate introduction surviving independently in the wild have a different status from that of the seed arriving by bird? Usher (2000) points out that there are "shades of nativeness", and suggests a classification into native, formerly native (now extinct here), locally non-native (though native in Britain), long-established introduction, recently arrived (naturally or not) and non-native (brought by people, intentionally or unintentionally). The question needs to be asked as to why we want to make such distinctions anyway, beyond their academic interest? It could certainly be useful to know that a plant is a recent arrival, since that implies that we do not know how it will behave here, and may therefore need to study it in the interests of pre-existing plants and plant communities. Beyond that, if a plant is an established member of our flora, why do we need to concern ourselves with its position on a native-alien continuum? If we do, the approach used for *Atlas 2000* is perhaps the most helpful. Natives and long established aliens such as Sycamore were to be recorded without comment. For other aliens, there was an option to distinguish (as recommended by the BSBI subcommitteee above):

- established in the wild for at least 5 years and spreading spontaneously;
- established 5 years but not spreading spontaneously;
- casual (present for less than 5 years or intermittently);
- deliberately planted and not established.

This represent a range of information which could be really useful. Clement and Foster (1994), in recording aliens specifically, used a similar scheme, but with a two-year rather than a five-year criterion.

Recording sites, rather than species, is often helped by using the *National Vegetation Classification* (Rodwell 1991). This is a series of descriptions of types of plant community which includes not only its composition and structure, but also its relationship to important environmental factors, the zonations and successions in which it is commonly found, its distribution in Britain and its wider affinities among the vegetation types of Europe. It is, therefore probably too complex for use by amateurs except under expert guidance, requiring reference to a number of volumes of descriptions *(eg* Rodwell 1992), though a computerised database is available which is claimed to make it more accessible. It has been used by at least two WBS members who are also professional botanists.

Photographic recording can be very helpful for monitoring the overall condition of sites. Jones (1994) describes how it is being used for this purpose in Wales. Photographs should be taken with a 35 mm lens from carefully selected fixed points and in a panoramic arc with about 10-25% overlap. The camera should be on a tripod and the tripod be photographed afterwards to help identify the spot for repeat photographs at later dates. Jones recommends black and white film, mainly because colour slides change colour after some decades. I find this unconvincing, since some colour could still be better than none and, as he acknowledges, the development of digitised colour images may alter the situation entirely. WWT plans to introduce photographic recording for monitoring biodiversity on its reserves (Mantle and Power 1997).

Recording systems.

Nationally, much consideration has been given in recent years to developing a computerised system to be used by everyone. This has been a particular problem area in Wiltshire. The *Wiltshire Flora Mapping Project* data were originally entered into *dBase 3*, but, in an attempt to find a system which could be used by everybody, WBRC subsequently

switched to *Biobase*, which was being recommended nationally at the time, and this was used also for several years by WBS. When *Atlas 2000* was planned, it was believed that *Biobase* would be easily compatible with *Recorder*, the *Atlas 2000* database. This proved not to be the case, and many hours of work were required to convert the data. WBS eventually decided that *Biobase* did not suit its purposes either, because no suitable way could be found of printing out from it the information it wanted to feed back to members. It now uses a *Microsoft ACCESS* database, which is perfectly satisfactory. Efforts nationally to agree on a database have centred round *Recorder*. The new edition, *Recorder 2000* is now on sale at around £100. It is versatile and can, for instance, produce distribution maps and count the number of taxa in each tetrad. But it's complicated and requires a great deal of expertise for comprehensive use. Distributing companies offer support, but the scheme is not recommended for general use yet (Lockton 2000). Perhaps it would be better to use different databases for different purposes and concentrate on developing devices for transferring data from one system to another. In the immediate future, systems used in Wiltshire are unlikely to change, but discussions are taking place between WBS and WSBRC on ways of exchanging data. In the long-term, web sites could be useful. Lockton (2001) refers to several currently in operation and predicts a useful future for the practice.

Conclusions

It is clear that there has been much recording of plants in Wiltshire. It has followed similar trends to those occurring in Britain generally, and the same issues are relevant. It is hoped that both the activity and the debate will continue to flourish in both spheres.

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GENTIANELLA GERMANICA AND *GENTIANELLA CILIATA* IN WILTSHIRE

Tim Rich and Andy McVeigh

Introduction

Of the six *Gentianella* taxa which have been found in Wiltshire, Gillam, Green and Hutchison (1993) gave recent records for only *G. amarella* and *G. anglica*. In 2001, *G. germanica* and its hybrid with *G. amarella* (= *G. × pamplinii*) were rediscovered. *Gentianella campestris* and *G. ciliata* are thought to be extinct. In this short note the records for *Gentianella germanica, G. × pamplinii* and *G. ciliata* are discussed to stim- ulate further searches for the taxa in likely areas. The best time to look for them is late summer. We would be happy to examine any specimens!

***Gentianella germanica* (Chiltern Gentian) and its hybrid**

Gentianella germanica, G. × pamplinii and *G. amarella* can be distinguished using the characters in the table overleaf, updated from Rich and Jermy (1998). In the field, *G. germanica* has much larger flowers clustered at the top of the stem, is often flushed purple and has broader leaves than *G. amarella*. The hybrid is intermediate, and can be picked out from *G. amarella* by the longer corollas. *G. germanica* and the hybrid usually begin flowering from August onwards, after *G. amarella*, though all may continue well into autumn.

Gentianella germanica was first reported in Wiltshire from Mere Down (v.c. 8) by E F Linton (Tatum 1893; Grose 1957), but the only specimen of his that we are aware of is *G. × pamplinii* collected on 8 September 1891 **(BM)**. On 12 September 2001, T C G Rich revisited Mere Down and found one population of *G. germanica* and more scattered populations of *G. x pamplinii* amongst abundant *G. amarella* on the eastern half of the site (all in one kilometre square ST8233). Only five 'good' plants of *G. germanica* were seen, and the population appeared heavily hybridised with *G. amarella*.

Gentianella germanica was found plentifully in an old chalk pit nearly ½ mile north of Shalbourne Church (also v.c. 8) by C P Hurst on 23 September 1910, with *G. amarella* and *G. × pamplinii* (**OXF**, with correspondence). G C Druce visited it in 1913, again collecting both *G. germanica* and *G. × pamplinii* **(OXF)**. It appears to have been last collected by Hurst in 1919 (Grose 1957). When A McVeigh and J Carey visited this site in 1999 a pit in approximately the same location had been filled with spoil and nettles.

Hurst also told Grose (1957) of another locality beyond Ham, but Grose was uncertain if it was in Wiltshire. Given the number of records of *G.*

germanica from Inkpen Hill, Rivar Copse, Walbury Hill and East Woodhay over the county border in Berkshire (which Grose had visited), it would not be surprising if it occurred in the Ham Hill area, which would also be worth searching.

The Pitton record for *G. germanica* queried by Grose (1957) refers to the following species.

***Gentianella ciliata* (Fringed gentian)**

Gentianella ciliata is easily distinguished from the other *Gentianellas* by the conspicuous, large flowers which have long fringes along the outsides of the corolla lobes as well as inside (fringed inside only in other species). It also flowers late in the season (August-October) but does so sparingly. The rediscovery of this exceptionally rare species would be stunning.

Dowlen and Ho (1995) discovered a specimen of *G. ciliata* in the Natural History Museum (**BM**) which had been collected at Pitton, Wiltshire in September 1892 'on Down at junction of chalk and tertiary bed' . It had been wrongly named as *Gentiana pneumonanthe* (Tatum 1893) and then as '*Gentiana uniflora* Willd. [synonym not traced] "but the specimens are peculiar and monstrous", Arthur Bennett' (Tatum 1894). Dowlen and Ho (1995) attribute the specimen to E J Tatum, but Tatum stated that the specimen was collected by Miss Henderson.

Acknowledgements

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Table of characters used for distinguishing Gentianella taxa

Note: It is best to use averages of at least 5, preferably 15, plants.

	G. amarella subsp. *amarella*	*G. × pamplinii*	*G. germanica*
Habit	Small, usually 7-20(-30) cm tall, often branched above and below	Robust, usually 20-40 cm tall, often branched above and below	Robust, usually 15-40 (-50) cm tall, often branched above only
Internodes above basal rosette	(5-)6-10(-12), usually short	(5-)7-11(-13), usually long	(4-)7-12(-16), usually long
Middle stem leaves	Narrow, (1.5-)2.5-5 (-7.5) × as long as wide	Intermediate, (1.5-)2.3-4.3(-6.5) × as long as wide	Broad, 1-3(-3.5) × as long as wide
Largest corolla length (including lobes)	(12-)14-19(-20) mm	16-24 mm	(15-)22-30(-35) mm
Corolla tube	Cylindrical	Intermediate	Obconical (funnel shaped)
Corolla length: calyx length ratio	Corolla 1.25-2.3 × as long as calyx	Corolla (1.4-)1.6-2.4 (-3.2) × as long as calyx	Corolla (1.6-)1.9-2.7 (-2.8) × as long as calyx

Tim Rich can be contacted at the National Museum and Gallery, Cathays Park, Cardiff CF10 3NP.

Andy McVeigh can be contacted at 34 Tweedale Close, Mursley, Milton Keynes MK17 0SB.

MEADOW CLARY *(SALVIA PRATENSIS)* - THE AWDRY SITE

Michael Smith

In the latest Wiltshire Flora (Gillam et al 1993), the impression is gained that the surviving site of Meadow Clary *(Salvia pratensis)* at Tenantry Down is the same as that of the 1924 record by Awdry (Grose 1957). Certainly, this is how Walker and Pywell (2000) interpreted it. However, this view is questionable.

There is a considerable distance between "the downs above Little Cheverell", the site as attributed to Awdry, and Tenantry Down. The 1842 tithe map and schedule and the sale catalogue of 1910 both document the parcel of land which contains the present *Salvia pratensis* site at Tenantry Down as "arable". The farming regime between 1910 and 1932 was consistently arable and free range pigs (Pepler 2000). This strongly suggests that during 1924 the Tenantry Down site was not the "remote grassy place" described by Awdry, and was a most unlikely site for *Salvia pratensis*. It was only after 1932, when new demands imposed on the occupiers curtailed arable activities that it was able to revert to a grassy environment.

It follows that Awdry's site probably was indeed above Little Cheverell and has nothing to do with the present *Salvia pratensis* site. The plant was not recorded in the Little Cheverell area during the surveys in the 1980s for the 1993 Flora, nor is it noted for there in the running dossier on natural history and other cultural matters kept by the MOD for the Salisbury Plain Training Area West (which does record two plants in the Tenantry Down area in the 1980s). However, further searches there may be worthwhile. One possibility is suggested by the 1920 sale catalogue of Cheverell Hill Farm and in particular the land described as "Pasture" immediately to the west of the plantation at ST975517. During my last visit in 1997 this was still pasture, unimproved and floristically excellent and known to few. Investigation might well start there.

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ORCHIDS AT MORGAN'S HILL

LOUISE DENNING

Objectives

During the summer of 2000, I undertook a botanical survey of Morgan's Hill, a Wiltshire Wildlife Trust reserve in the centre of the county. The study was part of the assessment for my Masters degree submitted in September 2000 and was also intended to be helpful to the Trust. A copy of the full thesis (Denning 2000) is lodged with the Trust at their headquarters in Devizes. A major part of the thesis dealt with the vegetation communities of the site, and these have been described in an earlier article (Denning 2002), which includes fuller description of its status and characteristics. The current article describes another element in the work - the collecting of abundance data on orchid species within a quarry area and relating this to a number of environmental variables.

The earlier article contains a map showing the location of the old quarry area within the reserve - Figure 1 in Denning (2002). It consisted of a number of quarries providing a variety of steep sided slopes of all aspects as well as several flat areas and two mounds. In general the vegetation cover was sparse on the slopes, with the sward being heavily influenced by rabbit grazing and burrowing, whilst the flatter areas had generally longer swards with a greater number of ruderal species (*ie* not native in this kind of environment). The Quarry Area was found to contain the majority of the eleven orchid species found within the site. It was decided to collect environmental data from within this area in an attempt to understand their distribution. A number of orchids of note grow within this area including *Ophrys insectifera* (Fly Orchid), *Platanthera bifolia* (Lesser Butterfly-orchid) and *Herminium monorchis* (Musk Orchid). In addition, the unusual occurrence of *Epipactis palustris* (Marsh Helleborine) was to be investigated.

Sampling strategy

Sampling within the Quarry Area was designed to cover as much of it as possible whilst removing those sites which were obviously not populated by orchid species. Therefore, an initial site survey over all the quarries was made which focused the area of study. For example the bottom of each quarry was not surveyed as this was generally found to contain a high concen- tration of ruderal and scrub species. Once this was established a suitable sampling scheme was developed, where each aspect within each quarry was surveyed in a systematic manner independently of the others. This stratified sampling scheme allowed data to be com- pared at the quarry level or at the aspect level, with its main benefit over random stratified sampling being the increased precision of the estimation of the population. A systematic

sampling scheme ensures a good coverage of the area without allowing preconceptions as to species distributions to influence the survey.

Surveying of the orchids occurred between 6th and 20th of June 2000. This ensured that the majority of the species were flowering when the surveying took place to ease identification. It should be noted that a couple of individuals of *Platanthera bifolia* were seen flowering within the Quarry Area at the end of May but had finished by the time the surveying had started.

A number of environmental variables were measured in an attempt to assess those conditions which influence orchid distribution over the Quarry Area. These measurements were taken systematically down the slope every two metres. At each distance the following were noted: sward height (to understand the effects of grazing and competition), pH, soil depth, and soil moisture content as well as the degree of the slope and aspect. These environmental variables were designed to answer a number of hypotheses relating to the distribution and number of orchids growing within the Quarry Area.

Results

As noted, each quarry and its aspect were surveyed separately down the entire face. In total 1299 1 m squares were surveyed within this area of the reserve with 4358 orchids being counted from seven different species. The table on this page shows the numbers of orchids found at each aspect and the total number of each species present within the entire Quarry Area.

The pH of the Quarry Area is thought to be the least influential environmental variable on orchid distribution as it had a relatively small range (7.23-7.81) differing in pH by 0.58. Sward height in comparison showed a greater range than pH across the site with the vegetation varying from 2cm on the steep sided slopes where rabbit grazing was highest to 18cm at the bottom of the slope and in shaded areas. Similar differences between the ranges were seen with soil depth and soil moisture content and it is thought that these ranges were also related to the slope. Therefore trying to ascertain which of these environmental variables influenced orchid distribution was difficult.

Various statistical analyses were made using data from three species, *Ophrys insectifera*, *Epipactis palustris*, and *Dactylorhiza fuchsii*, from which it appears that sward height and aspect were the most significant environmental variables. For example there was a strong tendency for *E. palustris* to be found on flat areas and north facing slopes angled less than 30°.

Analysis and discussion

A summary of the findings for each of ten of the eleven orchid species found within the Quarry Area is given below along with its status at the county level. *Epipactis palustris* is considered in a separate section because of its more detailed treatment.

***Dactylorhiza fuchsii* (Common Spotted-orchid)** is found throughout the county and is the most frequently recorded orchid. Within the Quarry Area, it showed a preference for the northern slopes, but was found in high numbers across the whole area. Elsewhere within the reserve this orchid is found within many of the NVC areas.

***Ophrys insectifera* (Fly Orchid)**. In total 16 plants were found growing within the quarry area in the survey (although another four were found in the weeks before the survey). These plants were found in two main areas - on the two mounds and on the north-west slope of one quarry. Aspect appeared to be the most influential factor in their distribution. Grose (1957) states that *O. insectifera* is found in "*woods and scrub on calcareous soils; occasionally in chalk grassland where local conditions provide partial shade*". This describes the conditions under which the plants at Morgan's Hill are found with the encroaching scrub from Horsecombe Bottom providing shade during the peak of the day. In the

Aspect	East	Flat	North	North-west	West	South	Total
***Anacamptis pyramidalis* (Pyramidal Orchid)**	0	6	25	11	20	0	**62**
***Coeloglossum viride* (Frog Orchid)**	0	8	9	1	0	0	**18**
***Dactylorhiza fuchsii* (Common Spotted-orchid)**	74	300	732	249	274	15	**1,629**
***Epipactis palustris* (Marsh Helleborine)**	105	531	812	269	467	9	**2,184**
***Gymnadenia conopsea* (Fragrant Orchid)**	0	78	17	18	51	0	**164**
***Listera ovata* Common Twayblade)**	20	63	93	12	29	2	**217**
***Ophrys insectifera* (Fly Orchid)**	1	0	15	0	0	0	**16**
Non-flowering / Unidentifiable.	1	0	2	0	4	0	**7**
Number of orchids per slope	**201**	**978**	**1,705**	**560**	**845**	**26**	**4,289**

past, records have shown populations of up to 200 (for example in 1989), but populations fluctuate from year to year. In Wiltshire the population of this orchid is decreasing in the southern vice-country, and is becoming relatively rare, being found in only 12 1km squares.

***Gymnadenia conopsea* (Fragrant Orchid)**. This species was found on all aspects other than east and south. However, this may be due to fewer east and south slopes being present within the quarry and therefore being surveyed, rather than a preferential distribution towards the other aspects. In total 164 fragrant orchids were noted, but no previous records as to the numbers could be obtained.

***Listera ovata* (Common Twayblade)**. This is frequent on calcareous soils and is generally regarded as a species of woodland and scrub. In the Quarry Area, it was noted to be growing mainly on the west slopes as well as on the flat. It was especially common in areas of partial shade.

***Coeloglossum viride* (Frog Orchid)**. Like *Ophrys insectifera*, this species fluctuates in number from year to year. Because it is easily overlooked, it is expected that this in itself influences the numbers recorded. In the 2000 survey, 18 were spotted distributed within three colonies - nine were found on the mounds, eight on the flat along with the *Epipactis palustris* and one on a north-west facing slope. In past years several hundreds have been noted.

***Anacamptis pyramidalis* (Pyramidal Orchid)**. This is particularly common in Wiltshire, with its only limiting factor being calcareous soils. Within the Quarry Area, 62 were found growing in a similar situation to *Gymnadenia conopsea*.

***Platanthera bifolia* (Lesser Butterfly-orchid)**. This was the only orchid species not surveyed within the quadrats, but was observed elsewhere. This species was not included in the survey as it had finished flowering by the time the surveying had started. Secondly, the majority of the plants within the reserve were noted on the north-west slopes of the Wansdyke rather than in the Quarry Area. This species was relatively hard to count as the individuals were spread over a wide area. In North Wiltshire it is found in relatively large numbers across the Marlborough Downs, whereas in South Wiltshire it was only found within 5 1km squares in quantities of 10-20 at each location.

***Herminium monorchis* (Musk Orchid)**. This nationally scarce species was not found during the extensive survey of this area. Its presence is noted in Gillam, Green and Hutchison (1993) which states that a "*very small colony grows at Morgan's Hill, known for many years but not found every year*". Morgan's Hill is the only known site for this species within Vice-county 7. Since 1957, when Grose surveyed the region, this species has become rarer throughout the country, especially in Wiltshire where it remains in only 6 1km squares.

***Ophrys apifera* (Bee Orchid) and *Orchis ustulata* (Burnt Orchid)**. These nationally scarce species have both been known from within the site. *Orchis ustulata* was noted in Grose (1957) as growing at Morgan's Hill, but has not been observed since. In the surrounding area, it grows on the escarpment near Cherhill and it is hoped that it may re-establish itself within the reserve. *Ophrys apifera* has also been noted in the past. It is a frequent species of old disused chalk quarries etc. and therefore may re-colonise the area in the future.

Findings for *Epipactis palustris* (Marsh Helleborine)

One of the major aims of this study was to understand the distribution of *Epipactis palustris* on Morgan's Hill. This species is generally regarded as growing within "*fens, base-rich marshy fields and dune-slacks*" (Stace 1997). However, a growing population of this species has been monitored since 1937 when Grose (1957) first noted this peculiarity at Morgan's Hill. He states "*The plants grow in and about a little grassy hollow high up on the chalk down and are associated with the usual downland species*". Gillam, Green and Hutchison (1993) note that it has been known for a long time "*in a vegetated old chalk quarry, where nine orchid species grow. The number of plants has increased from 20 in 1960 to 300 in 1992. A second colony of 100+ plants 50m higher up the hill was discovered in 1988*". The survey of this population in 2000 showed a substantial increase in numbers with several colonies developing away from the main population. In total, 2184 flowering spikes were counted, with the majority being found on the north facing slopes and on the flat areas.

Nilsson (1977) notes that it "*occasionally migrates into different habitats especially newly-exposed ground such as abandoned gravel pits and earthworks*". Therefore, it seems possible that one plant became established shortly after the Quarry Area was left and that it has increased in number vegetatively since that time. It produces creeping rootstock that enable the it to spread quite quickly (Davies, Davies and Huxley 1983).

Although no reason was established for its distribution within the Quarry Area *ie* sward height, pH, soil depth or moisture content, it would seem advisable not to be dismissive of the evidence. It should be noted for example that the reason might be seasonal fluctuations in moisture content rather than summer values. Therefore, it would be advisable to re-survey these values throughout the year.

Since submitting my dissertation thesis an article regarding *Epipactis palustris* was published in the BSBI news (Denning 2001), in which I asked members if they knew of any similar occurrences of *E. palustris* on chalk grassland. The following comments were sent to me as a result of my article.
Mr D. MacIntyre - Walton Common in Norfolk - chalk spring where small population of *E. palustris* grows (10-20 in 1995). Two miles south-east, a second population *of E. palustris* is found at Knarborough. This time *E. palustris* grows on well drained chalk on a disused railway embankment raised 5-10m above the surrounding arable land with *Koleria macrantha*, and *Anthyllis vulneraria ie* a dry chalk grassland community.

Mr A. Gendle - Waitby Greenriggs Nature Reserve, Cumbria – reserve consists of two parallel sections of disused railway cuttings and the land between them, the cutting having thin stony base rich soils. The reserve supports a population of about 4000 *E. palustris* plants. The majority are found on the stony sides of the cuttings (facing north-east) with *Ophrys insectifera* and *Gymnadenia conopsea*, and on the slightly deeper soils between the cuttings with *G. conopsea*, *Coeloglossum virde*, *Dactylorhiza fuchsii* and *Platanthera bifolia*. The reserve has been grazed by sheep for 4 months during the winter over the last 5 years, with trampling by sheep perhaps assisting the spread of this species.

Mr M. Atkinson - saw several thousand at a known site in Cumbria, about thirty miles from the sea. It was north-east facing and calcareous.

Mr P. Wilson - Box Hill, Surrey where *E. palustris* is of erratic appearance.

Mr D. Lang recalls seeing the plant at Swanscombe in North Kent within a chalk pit site (now destroyed). In 1956, 50 flowering spikes were found, by 1961 there were over 500, but by 1963 the site had become heavily scrubbed over and only 8 spikes were found. The last record David Lang had of *E. palustris* at Swanscombe was in 1966 when there were 15 spikes. He also notes that there was a slight morphological difference in those plants at Swanscombe as the plants were darker and shorter than those seen elsewhere.

Dr D. Allen saw 8 flowering plants on a chalk grassland site in East Devon (Goat Island NNR). Dr David Allen also quotes Summerhayes (1951) mentioning Morgan's Hill I presume as well as another site in Kent "*a very exceptional habitat .... in Wiltshire (near) Calne, where it occurs near the top of the chalk downs ..... (and) a similar state of affairs has been recorded ..... from Kent where .... E. palustris occurs in a disused chalk pit near Greenhithe"*.

These records of *E. palustris* are interesting as they show similar habitat requirements to those seen at Morgan's Hill. In particular it was interesting reading about the relative darkness of floral morphology and size of plants at Swanscombe, which I believe is maybe also true at Morgan's Hill where the plants where short, densely flowered and very dark in colour.

Conclusion

In summary a number of environmental variables were examined in an attempt to assess the reasons for variations in orchid numbers and their distribution within the Quarry Area on Morgan's Hill. As with many ecological studies the results provided some interesting and useful information, but were inconclusive and it is felt that a number of variables including those that I measured influence the orchid distribution.

I feel that a longer period of study was required to survey the orchids, as most of the work had to be carried out during the first weeks of June. Additional environmental variables of importance that perhaps should be included in future work include light intensity and soil nutrient status, as well as the taking of more soil moisture content records at different times of the year. It is felt that this may produce a higher significance when linking the environmental variables and the orchid species present. It may also be worth plotting the orchid distribution over the Wansdyke, an ancient earthwork also shown on the maps in the earlier article, which is more sparsely populated, to compare the environmental conditions that are similar for corresponding species.

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Wiltshire Botany 5, 2002, pages 29-33

IDENTIFYING NON-YELLOW WILTSHIRE CRUCIFERS

John Presland

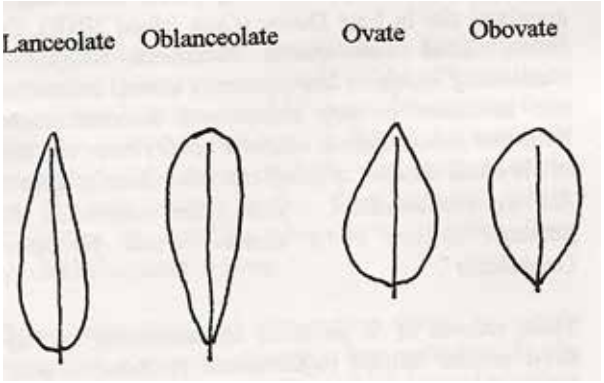
Introduction

In the previous issue of this journal, I presented a set of keys to identifying yellow crucifers recorded in Wiltshire since the early 1980s (Presland 2001). Here, I offer keys for the corresponding non-yellow species. Species with cream flowers are included in both sets of keys. The keys here follow the same lines as those for yellow species, in that:

- They cover all species noted in the latest Wiltshire Flora (Gillam, Green and Hutchison 1993) and all those known to be recorded since.
- They attempt to make distinctions unambiguous.
- Fruit characters are avoided, except for confirmation, unless there is no alternative.
- The keys are staged, to allow identification skills to be developed gradually.
- Much use has been made of the descriptions provided by the BSBI Crucifer handbook (Rich 1991), supplemented by the descriptions of Stace (1997), the illustrations of Ross-Craig (1961) and my own observations and photographs.
- They have been checked by following them for every species on the basis of the descriptions in the BSBI Crucifer handbook and checking possible problem areas by examining herbarium specimens. They have been checked also by using them in the field with almost all species in Key G, while many other species have been checked either in the same way or against earlier versions of the keys.

Identification of a plant as a crucifer, description of the characteristics of the family and an illustrated account of the characters used in the keys were provided in the earlier article. Unfortunately, the labels for the diagrams of lanceolate and oblanceolate and of ovate and obovate leaf shapes were accidentally inter- changed, though the descriptions were correct. A corrected version is shown below.

Figure 1: Corrected leaf forms



Using the keys

The new keys (pages 31-33) are as follows:

Ÿ KEY G concentrates on separating the species noted for 2% or more of the 1 km squares in the latest Wiltshire Flora. These are species which are likely to be encountered by all recorders at any level of coverage - at least in some areas of the county. The species named at each endpoint in this key will, in almost all cases, be correct. KEY G leads to KEYS H to Q for identification of less common species.

Ideally, any species identified in KEY G should be checked against any associated KEY H to Q to make sure it is not one of the less common species. In the short term, however, this can be left to a later stage in coming to identify the full range of species.

All keys are dichotomous. Each consists of a series of numbered choices, each requiring the user to choose which of two alternatives (*eg* 6 or 6a) applies to the plant under consideration. Each choice either identifies the plant or indicates a new numbered choicepoint or another key. The procedure is simply to begin at Choicepoint 1 and continue until the plant is identified or another key indicated.

It is wise to confirm the identification against illustrations and descriptions in other works, such as those by Rich (1991), Rose (1981) and Stace (1997, 1999). To facilitate this, the BSBI handbook number, prefaced by *r* (for *Rich*), is given for each endpoint species, enabling rapid location of descriptions for checking of the identification.

In some species, because of variation within it, a plant sometimes fits one alternative at a particular choice- point and sometimes the other. For instance, at Choicepoint 4 in Key G, Hairy Bitter-cress *(Cardamine hirsuata)* petals are normally more than 2 mm long, but can sometimes be absent. In such cases, there is a separate route through the rest of the key(s) for each possibility.

There may also be instances where, for reasons not anticipated, it seems impossible to choose between the alternatives at a particular choice point. It may be because all possible variations in a plant have not been taken into account. It may even be because the plant is poorly developed or damaged. If, for instance, the lowest leaves have withered away during a drought or been bitten off by animals, the distinction required at Choicepoint 2 in KEY G as to whether they are sessile or petiolate cannot be made. Where this problem occurs, it is best to follow each alternative in turn through the key and see which one works out.

If an identification made with the keys does not correspond with descriptions or illustrations elsewhere, it may well be that the plant under investigation is one that has not been recorded in Wiltshire in recent years. The alternative keys already mentioned should then be used.

The above “trouble-shooting” points have to be made, but it is hoped that they will rarely crop up in practice. The key has been designed to work.

Effective use of the keys requires a x10 lens and a ruler for measuring to the nearest ½ mm.

Warnings

It is hoped that the keys are accurate, but a word of warning is called for. Published descriptions of species characteristics do not always note the full range of variation in a species, often because this is not precisely known. For instance, the terminal leaflets of the basal rosette leaves of Hairy Bitter-cress *(Cardamine hirsuta)* are normally described as kidney-shaped, but can actually also be elliptic, ovate or round. Such information known to me has been taken into account in devising the keys, but there will undoubtedly be more that I have not detected. It is also probable that I have made errors, or have not tried out the key sufficiently in practice. It is hoped that users will let me know of any difficulties or any lack of clarity, so that any further work needed on the keys can be carried out.

Acknowledgement

Many thanks to Tim Rich of the National Museums and Galleries of Wales for encouragement, valuable comments on early drafts and access to his herbarium.

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Keys next page

KEYS TO NON-YELLOW WILTSHIRE CRUCIFERS

KEY G

1. All leaves in basal rosette, none on the stem **Common Whitlowgrass** *(Erophila verna agg)* r122 or **KEY H**
1a. Leaves present on stem, or no obvious stem present **2**

2. Lower stem leaves with petioles or leaves absent from lower half of stem **3**
2a. Most lower stem leaves sessile (though sometimes one or two petiolate at base and sometimes some leaves tapering to a narrow area at the base)**12**

3. Lower stem leaves much longer than broad and lobed, or leaves absent from lower part of stem **4**
3a. Lower stem leaves simple or with partial lobes round the edge of a roundish leaf **10**

4. All petals 2 mm or less long, or absent **5**
4a. At least the outermost petals more than 2 mm long **6**

5. Basal rosette of leaves present, with lobes elliptic ovate, kidney-shaped or round, and terminal lobe distinctly larger than lateral lobes
Hairy Bitter-cress *(Cardamine hirsuta)* r51
5a. Basal rosette of leaves either absent or with terminal and lateral lobes linear-oblong, linear-oblanceolate, lanceolate or ovate and, if ovate, then terminal and lateral lobes not clearly differing in overall size
Swine-cress *(Coronopus squamatus)* r134 or **KEY I**

6. Lower parts of lower stems horizontal
Water-cress *(Rorippa nasturtium-aquatica)* r59 or **KEY J**
6 Stems erect **7**

7. At least the outer petals more than 5 mm long **8**
7a. Petals 5 mm long or less **9**

8. Petal claw most commonly longer than limb, almost all of it long, narrow and parallel-sided; fruit much longer than broad, not flattened, and often constricted all the way round between seeds
Wild Radish *(Raphanus raphanistrum)* r1
8a. Petal claw shorter than limb, or tapering to base, or indistinct; fruit flattened, or not much longer than broad, or with no constrictions going all the way round between seeds, or not developing
Cuckoo-flower *(Cardamine pratensis)* r55 or **KEY K**

9. More likely to have the following: 4 stamens; 0-5 leaves on main stem; stem hairless or very sparsely hairy at the base
Hairy Bitter-cress *(Cardamine hirsuta)* r51 or **KEY L**
9a. More likely to have the following: 6 stamens; 3-10 leaves on main stem; stem distinctly hairy near the base **Wavy Bitter-cress** *(Cardamine flexuosa)*r52 or **KEY L**

10. Upper leaves clasping
Hoary Cress *(Lepidium draba)* r106
10a. Upper leaves not clasping **11**

11. Petals 9 mm or more long
Dame's-violet *(Hesperis matronalis)* r82 or **KEY M**
11a. Petals less than 9 mm long
Garlic Mustard *(Alliaria petiolata)* r83or **KEY N**

12. Upper leaves clasping (though sometimes very slightly) or heart-shaped at the base **13**
12a. Upper leaves not clasping and not heart-shaped at the base
Thale Cress *(Arabidopsis thaliana)* r42 or **KEY O**

13. Petals 4mm or more long **14**
13a. Petals less than 4 mm long **16**

14. Either plant hairless or inflorescence broad and with many branches forming a more or less flat top; fruits about as long as broad, excluding style, rounded **15**
14a. Plant hairy in at least some parts (sometimes only the rosette leaves); each inflorescence narrow with branches not forming a broad flat top; fruits parallel-sided, at least 6 times as long as broad
Hairy Rock-cress *(Arabis hirsuta)* r43 or **KEY P**

15. Patch-forming; fruit not winged and with style above top of fruit
Hoary Cress *(Lepidium draba)* r106
15a. Not patch-forming; fruit winged with style in a notch at the top
Field Penny-cress *(Thlaspi arvense)* r113

16. Fruits more or less like an upside down triangle
Shepherd's-purse *(Capsella bursa-pastoris)* r115
16a. Fruits not like an upside down triangle **17**

17. Patch-forming; inflorescence broad and with many branches forming a more or less flat top; fruit about as long as broad (excluding style) and not winged **Hoary Cress** *(Lepidium draba)* r106
17a. Either not forming patches or inflorescence narrow and with branches not forming a broad flat top; fruit either more than twice as long as wide or with a flattened wing at the apex and/or sides **Field Penny-cress** *(Thlaspi arvense)* r113 or **KEY Q**

KEY H

1. At least some hairs present on stem above lowest flower stalk; stem hairy below this
Hairy Whitlowgrass *(Erophila majuscula*) r122
1a. Stem hairless above lowest flower stalk; stem hairless or somewhat hairy below this **2**

2. Flowering stems with scattered hairs on the lower parts **Common Whitlowgrass (***Erophila verna sensu stricto)* r123
2a. Flowering stems hairless or with a few scattered hairs on the lower parts **Glabrous Whitlowgrass (***Erophila glabrescens)* r124

KEY I

1. Stems erect **Narrow-leaved Pepperwort** *(Lepidium ruderale)* r100
1a. Lowest stems more or less horizontal at base **2**

2. Petals 1-2 mm long; fruits kidney-shaped, usually enclosed in persistent, coarsely ridged sepals
Swine-cress *(Coronopus squamatus)* r134
2a. Petals 0.5 mm long or absent; fruit in two rounded lobes like miniature dumbbells, not enclosed by persistent sepals
Lesser Swine-cress *(Coronopus didymus)* r133

KEY J

1. Fruits aborting or deformed
Hybrid Water-cress *(Rorippa x sterilis)* r61
1a. fruits well-formed **2**
2. Fruits up to 9.5 times as long as wide; seeds in two rows
Water-cress *(Rorippa nasturtium-aquatica)* r59
2a. Fruits 10 or more times as long as wide; seeds in one or two rows **Narrow-fruited/Brown Water-cress** *(Rorippa microphylla)* r60

KEY K

1. Purple or black bulbils present in stem leaf axils
Coral-root *(Cardamine bulbifera)* r58
1a. No bulbils **2**

2. Outer petals larger than inner
Wild Candytuft *(Iberis amara)* r95
2a. All petals the same size **3**

3. Lowest leaves divided into separate lobes; fruits, when produced, more or less parallel-sided, at least 8 times as long as broad
Cuckoo-flower *(Cardamine pratensis)* r55
3a. Lowest leaves simple or with incomplete lobes; ellipsoid ovaries not developing into fruits
Horse-radish *(Armoracia rusticana)* r117

KEY L

1. Outer petals larger than inner
Wild Candytuft *(Iberis amara)* r95
1a. All petals the same size or petals absent **2**

2. Anthers blue or purple; fruits ovate to elliptic
Garden Cress *(Lepidium sativum)* r108
2a. Anthers yellow; fruits parallel-sided and at least five times as long as broad **3**

3. More likely to have the following: 4 stamens; 0-5 leaves on main stem; stem hairless at the base
Hairy Bitter-cress *(Cardamine hirsuta)* r51
3a. More likely to have the following: 6 stamens; 3-10 leaves on main stem; stem hairy near the base
Wavy Bitter-cress *(Cardamine flexuosa)* r52

KEY M

1. Lowest leaves elliptic or lanceolate
Dame's-violet *(Hesperis matronalis)* r82
1a. Lowest leaves ovate, heart-shaped at base
Honesty *(Lunaria annua)* r84

KEY N

1. Leaves smelling of garlic when crushed; lowest leaves simple, kidney-shaped or broadly triangular; fruit more than 6 times as long as broad
Garlic Mustard *(Alliaria petiolata)* r83
1a. Crushed leaves not smelling of garlic; lowest leaves rounded, ovate, lanceolate, oblanceolate or oblong, or lobed; fruits less than 3 times as long as broad or not developing **2**

2. Outer petals larger than inner
Wild Candytuft *(Iberis amara)* r95
2a. All petals same size **3**

3. Petals more than 5 mm long
Horse-radish *(Armoracia rusticana)* r117
3a. Petals 5 mm long or less **4**

4. Lowest leaves longer than 10 cm
Dittander *(Lepidium latifolium)* r105
4a. Lowest leaves 10 cm long or less **5**

5. Anthers blue or purple; fruit with flattened apical wings
Garden Cress *(Lepidium sativum)* r108
5a. Anthers yellow; fruit without wings
Danish Scurvygrass *(Cochlearia danica)* r126

KEY O

1. Outer petals larger than inner
Wild Candytuft *(Iberis amara)* r95
1a. All petals same size **2**

2. Petals more than 5 mm long; mature fruits rarely formed; immature fruits less than 6 times as long as broad **Horse-radish** *(Armoracia rusticana)* r117
2a. Petals less than 5 mm long; mature fruits at least 6 times as long as broad
Thale Cress *(Arabidopsis thaliana)* r42

KEY P

1. Petals 9 mm or more long
Garden Arabis *(Arabis caucasica)* r 47
1a. Petals less than 9 mm long **2**

2. Plant usually hairy throughout; petals white; seeds in one row
Hairy Rock-cress *(Arabis hirsuta)* r43
2a. Upper part of plant hairless; petals cream; seeds in two rows
Tower Mustard *(Arabis glabra)* r45

KEY Q

1. Plant hairless
Field Penny-cress *(Thlaspi arvense)* r113
1a. Plant hairy in at least some parts **2**

2. Separate petal claw and limb not or hardly obvious; fruit unwinged
Wall Whitlowgrass *(Draba muralis)* r119
2a. Petal claw distinct; fruit with flattened apical wings **3**

3. Anthers red or purple before splitting open, at least on their sides; style protruding well beyond notch at fruit apex
Smith's Pepperwort *(Lepidium heterophyllum)* r110
3a. Anthers yellow before splitting open; style hardly protruding beyond notch at fruit apex
Field Pepperwort *(Lepidium campestre)* r109

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PLANT RECORDS 2000

Explanatory notes

- The following is a selection from the records of Wiltshire Botanical Society in 2000. Records of common species and updates of the 1993 Wiltshire Flora are not included unless there is some special reason. Unconfirmed records have been omitted.
- An asterisk indicates that the species is not native to Wiltshire.
- Where a record is identified as being a new 10 km square record, this refers to the period since the flora mapping in the 1980s and 1990s for the 1993 Wiltshire Flora and recorded there. No earlier records of this kind are available locally.
- For new county and vice-county records, an unqualified statement means that it is the first record ever, as far as is known. Where the word "recent" is inserted, it means that it is the first since the flora mapping, but had been recorded before this period.
- Where a recording square is partly in Wiltshire and partly outside, any comment on the status of a record in that square applies only to the part within Wiltshire.
- Recorders are identified by initials as follows:

AD - Tony Dale
AH - Ann Hutchison
BL - Barbara Last
DG - Dave Green
DJW - Jeremy Wood
DL - Dominic Lamb
DOG - Daphne Graiff
EG - Ted Gange
FR - Francis Rose
JEO - Jack Oliver
JM - Jean Maitland
JO - John Ounsted
JP - John Presland
JRM - John Moon
JW - Jean Wall
JWa - J Wallace
MWi - Mike Wildish
NL - N Langdon
PD - Paul Darby
PJW - Pat Woodruffe
PL - Pete Lindsay
PSe - Pete Selby
RG - Rita Grose
RV - Roger Veall
SBr - Sharon Bracken
SEd - Stephen Edwards
SY - Simon Young

Vc 7 records

Agrostemma githago * - BS, Bradford-on-Avon, lots of plants appeared in the garden, not planted. 1st 10 km square record.

Allium paradoxum * - JWa, Corsham, Packeridge Wood, S side of track, 6 plants. 2nd vc record.

Araucaria araucana * - JEO, Between Great Bedwyn and Savernake Forest, Tottenham House, seedlings and one sapling around bases of parent trees, not planted; E of Tottenham Park, epiphytic saplings at 10' on Cedar of Lebanon, 1/4 mile from parent. 1stand 2nd county records.

Arum italicum * - JEO, SW of Marlborough, West Woods, old garden throw-out, persisted 7+ years. Nationally scarce plant. 2nd recent county record; Marlborough, riverside and by car park. Included in the Flora as the 1st recent county record and persisting in 2000.

Azolla filiculoides * - PD, Brinkworth, old farm pond at Grayways. Several sq m covering water surface.

Bidens pilosa * - JP, Winsley, 4 plants as garden weeds. 1st county record.

Centaurea nigra var. nemoralis - JEO, Oaksey, Clattinger Farm, in 2 fields, about 90 plants, form with white pseudoradiations. White form recorded only twice in the Flora.

Centaurium pulchellum - SY, Winsley, 7 plants in one small ploughed grassy strip at edge of flax field. 1st 10 km square record.

Ceratocapnos claviculata - JEO, E of Marlborough, Savernake Forest, many plants. Last recorded in this 1 km square in 1986. 2nd vc record.

Chaerophyllum aureum * - JP, Winsley, one plant, spontaneous garden escape which has persisted for many years. 1st county record.

Cirsium dissectum - PD, Minety, N of Somerford Common, unimproved hay meadow, c 10 plants.

Cochlearia danica * - JEO, Stratton St Margaret, A419, especially central reservation of carriageway, 1000s of plants in March 2000. 1st seen March 1999. 1st 10 km square record; Beckhampton Roundabout, 2 plants. 1st 10 km square record; Elm Cross, Council gritting area by A361 and B4041 crossroads, 1 plant. 1st 10 km square record.

Crassula helmsii * - JEO, E of Marlborough, Savernake Forest, Crabtree Pond, spreading rapidly into surrounding wet grass. 1st 10 km square record; JW, Swindon, Coate wood, pond.

Dactylorhiza praetermisa - SEd, Ashton Keynes, Cotswold Water Park,

Daphne laureola - PD, Brinkworth, Echo Lodge Meadows Trust reserve, small groups in hedgerow.

Euphorbia lathyris * - JEO, between Great Bedwyn and Savernake Forest, Tottenham House, on derelict stonework and rubble, not cultivated in recent years. 1st 10 km square record.

Euphorbia platyphyllos - JP , Winsley, 11 plants in one small area at edge of flax field. 1st vc 7 record this century.

Fagus sylvatica (no var. name yet) Oak-barked Beech * - JEO, E of Marlborough, Savernake Forest, in excellent condition, two sites.

Galeopsis bifida - JEO, E of Marlborough, Savernake Forest.

Hyacinthoides hispanica * - JEO, E Lockeridge, roadsides, scattered, white and blue plants. 1st 10 km square record.

Hypericum humifusum - JP, Gaspar, 2 plants on meadow path.

Iris foetidissima - JEO, E of Marlborough, Savernake Forest.

Kerria japonica - DPT, Braydon, nr Braydon Manor, in secondary woodland nr garden, single-flowered form. Sites not recorded in Flora, so 1st 10 km square record.

Lamiastrum galeobdolon ssp. argentatum * - JEO, E of Marlborough, Savernake Forest and to the south. 1st 10 km square record.

Lathyrus nissolia - DL, Wootton Bassett, disturbed track through field, many plants over 100m.

Lychnis flos-cuculi - SEd, Ramsbury, Knighton, by R. Kennet, white form.

Muscari armeniacum * - JEO, Oare, roadside near Park Farm, persistent for 10+ years.

Myosotis arvensis var. sylvestris (ssp. umbrata) * - JEO, Marlborough, W of Savernake Forest, about 3 plants. 1st county record.

Neottia nidus-avis - JM, Winsley, Murhill, single clump.

Nymphoides peltata * - JEO, E of Marlborough, Savernake Forest, Crabtree Pond, slowly spreading after introduction in 1986-7.

Ophrys apifera - SEd, Ashton Keynes, Cotswold Water Park.

Oxalis corniculata * - JEO, Marlborough several patches on A4 roadside. 1st 10 km square record.

Polypodium interjectum - JEO, E of Marlborough, Savernake Forest, epiphytic on oak, at least 20x more common than *P. vulgare*.

Potamogeton crispus - JEO, Malmesbury, slack water nr R. Avon.

Prunus cerasifera * - JEO, E Lockeridge.

Pteridium aquilinum - JEO, E of Marlborough, Savernake Forest, growing up amongst young Douglas Fir. Measured by J Wall : 4.65 m (15ft 10ins).

Pyrus pyraster - JEO, between Great Bedwyn and Savernake Forest, NNW of Tottenham House, against wall by old stable enclosure. 1st 10 km square record.

Quercus robur var. cristata (The Savernake Cluster Oak) - JEO, E of Marlborough, Savernake Forest. The mutant refound, originally noted in Gardener's Chronicle 1917.

Ranunculus circinatus - JEO, Malmesbury, R. Avon.

Salix x reichardtii - JEO, E of Marlborough, Savernake Forest; also Tottenham Park to the E. Numbers of intermediates amongst *S. caprea* and *S. cinerea* in wetter areas among brambles, rhododendron, laurels.

Salix x sericans - JEO, Malmesbury, R. Avon.

Tilia platyphyllos - JEO, Great Bedwyn, E of

Tottenham Park, rough pheasant cover on farmland. Probably an ancient planting in the 1700's.
Typha angustifolia - JEO, E of Marlborough, Savernake Forest, Crabtree Pond. Introduced in 1986 or 1987 and slowly spreading.
Valerianella carinata - RG, Woodborough, wall near church.
Verbascum phlomoides * - JP, Winsley, one plant on spoil heap. 2nd recent county record.

VC 8 records

Anchusa azurea * - BL, Stapleford by R. Wylye in wild garden; Little Durnford, hedgerow. Garden escape not recorded in flora, but noted in Grose as recorded at Larkhill in 1943. 1st and 2nd recent county records.
Antennaria dioica - FR, Martin Down, Hants. 1st county record.
Blackstonia perfoliata - ER, North Tidworth, SPTA, two strong and sturdy plants. 1st 10 km square record.
Blechnum spicant - ER, West of Collingbourne Kingston, Everleigh Ashes, old conifer plantation. 1st record for this wood and 1st 10 km square record.
Callitriche obtusangula - RV, West Dean, in R. Dun. 1st 10 km record.
Carex pallescens - BL, N of Farley, Hound Wood.
Carex pseudocyperus - AH, Stourhead area, woodland. 2nd Wiltshire record, but in vc 6.
Centaurea cyanus - BL, Cholderton, H Edmonds weed patch. Now Red Data Book species. 1st 10 km square record.
Chamaecyparis lawsoniana * - JEO, Near Pewsey Station, two seedlings. 1st 10 km square record.
Colchicum autumnale - BL, Berwick St James.
Conyza canadensis * - NL, Salisbury, Culver St car park.
Cyclamen hederifolium * - PL, Trowbridge, Green Lane Wood, where found in 1998.
Equisetum fluviatile - RV, West Wellow, north of R. Blackwater in wet meadow.
Euphorbia platyphyllos - JO and PSe, East Martin, Hants, Talks Farm**.**
Fumaria officinalis ssp. wirtgenii - RV, West Wellow, W of Foxes Lane, arable field. 1st 10 km square record.
Galinsoga quadriradiata * - BL, Salisbury, St. Thomas churchyard. 1st 10 km square record.
Geranium columbinum - BL, Tilshead. 1st 10 km square record.
Geranium endressii * - BL, Chilmark, Pitt Wood. Only 5 county records in the flora. 1st 10 km square record**.**
Iris foetidissima - RV, West Wellow Common, nr Corner Cottage. Several clumps, ? garden outcasts. 1st 10 km square record.
Kickxia elatine - JO and PSe, East Martin, Hants, Talks Farm.
Kickxia spuria - JO and PSe, East Martin, Hants, Talks Farm; JRM, North Tidworth, Perham Down, wheat field.
Legousia hybrida - JRM, North Tidworth, Perham Down, wheat field stubble.
Lysimachia punctata * - RV, West Dean recreation ground, escape from adjoining garden.
Malva neglecta - DOG, Newton Tony, 1st 10 km square record
Nepeta cataria * - DJW/PJW, W of Downton, New Court Down, edge of newly made estate road, 90 plants. New site; Longford Farm, c. 30 plants. Believed to be new site.
Papaver hybridum - BL, Cholderton, H Edmonds weed patch; JO and PSe, E Martin, Hants, Talks Farm. Nationally scarce plant.
Persicaria capitata * - BL, Salisbury, Ivy Street. Also recorded in Milford St 1996 and Gigant St 1994. 1st 10km square records**.**
Phalarus aquatica - DJW, Whiteparish, Moor Farm. 1st vc record.
Phyteuma orbiculare - ER, Tilshead, near Westdown Camp, two substantial groups of plants. Nationally scarce species. 1st 10 km square record.
Pilosella aurantiaca * - EG, Alderbury, new arrival in garden. 1st 10 km square record.
Pinus radiata * - RV, NW of Martin, Toyd Farm, two mature trees planted as part of windbreak. 1st county record.
Poa angustifolia - RV, N of Whitsbury, Whitsbury Down, verge of track. 1st 10 km square record.
Polypodium interjectum - JEO, Stourhead gardens, epiphytic on oak. 1st 10 km square record.
Ranunculus hederaceus - RV, West Wellow, W of Foxes Lane, in wet meadow N of R. Blackwater. 1st 10 m square record.
Scandix pecten-veneris - SBr, Ludgershall, fringes of an extensive arable field planted with winter barley, c. 50 plants. Nationally scarce species. 1st 10 km square record**;** MWi, Chute Causeway, c. 100 plants growing into intensive wheatfield. 1st 10 km square record.
Schoenoplectus lacustris - BL, Tisbury, Mill Farm. 1st 10 km square record.
Senecio viscosus - RV, Dean Station, eastbound platform. 1st 10 km square record.
Setaria pumila - DJW, Whiteparish, Moor Farm.
Sison amomum - JO and PSe, East Martin, Hants, Talks Farm; North Tidworth, Perham Down, occasional in arable field wheat stubble. 1st 10 km square records.
Symphytum tuberosum * - BL, Middle Woodford. 1st 10 km square record.
Valerianella dentata - JO and PSe, East Martin, Hants, Talks Farm.
Thlaspi arvense - JRM, North Tidworth, Perham Down, MOD, rare in arable field wheat stubble. 1st 10 km square record.
Veronica polita - JRM, North Tidworth, Perham Down, wheat field stubble.
Vicia sativa ssp. segetalis - JO and PSe, East Martin,

Hants, Talks Farm Not recorded separately in Flora and therefore a 1st county record.
Viscum album - RV, Martin, in field in village, on *Malus domestica*. 1st 10 km square record; Toyd Farm, on *Populus x canadensis*.

PLANT RECORDS UPDATE VC 7 1994-1999

Additional recorders not mentioned for 2000

AS - Audrey Summers
BG - Beatrice Gillam
MB - Marilyn Beale
JN - Joy Newton
JTu - John Tucker
PWe - P Weaver

1994

Ophrys apifera var. belgarum - JTu, Box, Hazelbury Common. 1st found by JTu in 1987 but not then accepted as a constant variety. 1st county record.

1997

Lathyrus nissolia - PWe, Corsham E, 2 groups, of 2 and 5-6 plants.

Symphytum grandiflorum x S. uplandicum Hidcote - JEO, SW of Marlborough, West Woods, nr. site of old Fosbury Cottages. 1st county record; JEO, Clatford, dumped earth embankment. 2nd county record.

1998

Alchemilla mollis * - JEO, Lockeridge S, roadside.

Berberis vulgaris * - JEO, Clatford Hall, track, poss- ibly planted.

Briza maxima - JEO, Chiseldon S, dismantled railway track. 2nd recent county record.

Campanula portenschlagiana - JEO, Swindon SW, W of Princess Margaret Hospital, pavements, walls and wall-angles. 1st 10 km square record.

Carex filiformis - DG, Oaksey, Clattinger Farm, huge increase and a new population discovered in 2nd pasture.

Carex ovalis - AS, nr Gt Bedwyn, Chisbury Wood. 1st 10 km square record.

Cicerbita macrophylla ssp. uralensis - JEO, E of Marlborough, Savernake Forest, by private track. New 10 km square record.

Cotoneaster horizontalis - JEO, Swindon SW, W of Princess Margaret Hospital, pavements, walls and wall-angles. New 10 km square record.

Cotoneaster sternianus - JEO, Swindon SW, W of Princess Margaret Hospital, pavements, walls and wall-angles. New county record.

Daphne laureola - PD/JEO, Minety, Somerford Common Woods.

Lathyrus latifolius - JEO, Swindon S, S of Princess Margaret Hospital, rough ground; JEO, Swindon S, very common on disused railway embankment.

Linaria purpurea - JEO, Swindon SW, W of Princess Margaret Hospital, pavements, walls and wall-angles; MB, Swindon N, path, wall tops, rough ground.

Lolium perenne (semi-paniculate form) - JEO, Swindon NW, old railway track nr. Elboro Bridge, form with some stalked branchlets and spikelets.

Prunus x fruticans (P. spinosa x P.domestica) - JEO, Lockeridge, several locations; Clatford, introduced. Recorded as aggregate in Flora.

Rosa micrantha - JN, Ogbourne St George, old railway track, 1km from previous finds on same track. New 10 km square record.

Rosa stylosa - JN, Compton Bassett, nr Cherhill, 3 very large old bushes 6m high, also another nearby. New 10 km square record.

Rubus armeniacus - JEO, Clatford, grassy embankment, probably bird-sown. 3rd county record.

Salix eleagnos - JEO, Swindon NW, layering in rubble of new development. 2nd recent county record; Minety, Somerford Common Woods. Very rare in N Wilts. 3rd recent county record**.** Recorded as agg. in Flora.

1999

Azolla filiculoides - PD, Brinkworth, pond, covering at least 4 square m. 1st 10 km square record.

Daphne laureola - PD, NE of Luckington, Woodbridge Copse, at least 50 plants.

Gentianella anglica - BG, nr Devizes, Roundway Hill Covert, 100+ plants.

Polystichum aculeatum - PD, NE of Luckington, Woodbridge Copse, at least three plants.

Smyrnium olusatrum - BG, nr Devizes, Roundway Hill Covert, one plant beside woodland path.

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(continued)

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