A New Flora of v. c. 59 (South Lancashire): a progress report

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ABSTRACT

There has only been one previous Flora that covers the whole of v.c. 59 (South Lancashire) and this was published in 1963. A new Flora is in preparation with several seasons of fieldwork already undertaken. The Flora will cover vascular and non-vascular plants and fungi. The proposed format of the Flora is described, along with potential uses of the data and problems with interpretation. The publication date is likely to be 2004 or 2005.

INTRODUCTION TO V.C 59 (SOUTH LANCASHIRE)

Vice-county 59 (S. Lancs.) covers an area of approximately 3000 km^2. The area is bounded by the Rivers Ribble and Mersey to the north and south respectively, the Pennines to the east and the Irish Sea to the west. It combines some of the most densely populated areas within Great Britain within the Manchester and Liverpool conurbations, with distinctly rural areas in the north-eastern and north-western parts of the vice-county. Hence its major habitats include coastal, urban, lowland and upland areas.

The most significant botanical habitat within the area, on a national and international scale, is the Sefton coast. This stretches from Bootle, just north of Liverpool, to Southport (a distance of 24 km). In addition to the high floristic diversity of the area, several nationally rare and scarce species are found here (e.g. *Juncus balticus*, *Corynephorus canescens*). The extensive saltmarshes at the mouth of the Ribble also provide an important habitat for the specialised taxa that inhabit these areas.

In keeping with the rest of the country, within the lowland area agricultural intensification of the last 50 years has caused a drastic decline in species abundance. Only a few, small areas of traditional meadow survive amongst the extensive arable and grazing land. Those that do remain are generally afforded statutory protection (e.g. the Lancashire Wildlife Trust reserve at Charnock Richard pasture). Similarly the increased drainage of the uplands, the effect of acidification and the degradation caused by intense grazing have reduced the diversity of the uplands. For instance, the first British record for *Listera cordata* (Merrett 1666), a species now absent from the vice county, is from Pendle Hill. However, the uplands do support large expanses of the commoner upland species of base-poor areas (e.g. *Eriophorum vaginatum*, *Deschampsia flexuosa* etc.).

Lancashire is one of the least densely wooded counties (Spencer & Kirby 1992) in Great Britain with 4% woodland cover within Merseyside and Greater Manchester. The ancient woodland that does remain contributes to the plant diversity of the area. Such surviving woodlands are typically narrow, sinuous and in steep-sided valleys (e.g. Dean Wood, Wigan). The paucity of woodlands is partly due to their extensive clearance, primarily since 3000 BP (late Bronze age/early Iron age, Cowell, 1998) and partly by the extensive lowland mires that dominated the western plain of the county and the Mersey valley. The vast majority of these mosslands have been converted to arable land via drainage or peat extraction although odd relicts survive within the Mersey valley (e.g., Risley Moss) which are undergoing restoration.

Urban areas provide the usual habitats for ruderal species, such as *Linaria purpurea* and *Senecio squalidus.* In addition, the heavy industrialisation of the last 200 years has left a legacy of sites which are often floristically rich. This is due to the combination of nutrient-poor, extreme-pH substrate and lack of development. In addition, within many of these sites, there is high degree of habitat diversity. The importance of these locations is increasingly recognised, with some now being afforded statutory protection (e.g. Rixton Clay Pits, Warrington and Wigan Flashes).

THE NECESSITY FOR A NEW FLORA

Although there has been a tradition of producing local Floras (*Flora of Liverpool*, (Hall 1839) and *Flora Mancuniensis*) (Wood 1840)), there was no attempt at a Flora for the complete vice-county until *Travis's Flora of Lancashire* (Savidge *et al.* 1963). Fieldwork for this commenced following the formation of the Liverpool Botanical Society in 1906 and the work was close to completion in the early 1920s. However, financial constraints prevented completion from being achieved. Consequently W. G. Travis continued the fieldwork largely alone, until his death in 1958 when his manuscript was revised and completed by members of the Liverpool Botanical Society, with eventual publication in 1963. This remains the only treatment for the whole of the vice-county. Since it is almost 40 years since this work was published, with a great deal of the fieldwork incorporated into this Flora of a much greater vintage, a modern treatment of the vice-county based on new field records is appropriate.

Despite the advice generally given to Flora writers elsewhere at the conference, the work is being undertaken by a committee, chaired by Dr John Lowell. The anticipated breadth of the flora is beyond any individual on the committee. Moreover, within the group there is a wide range of expertise and knowledge which will allow the proposed treatment to reach fruition.

THE CONTENT AND EXTENT OF THE FLORA

In addition to the species details the Flora will include introductory chapters. The introductory chapters proposed will cover the following areas:

1. Method and duration of data collection and the extent of coverage of the Flora;
2. The history of recording within the vice-county;
3. The habitats and ecology of the area;
4. Important botanical sites in the vice county;
5. Biogeography.

While the proposed sections largely mirror those found in recent Floras, the aspirations of the committee are that it will reflect the special features of the area and hence give a distinct flavour of the locale. This is self-evident within the descriptions of important botanical sites. However, it is also the aim of the authors that this will inform other sections. For instance, the historical section will incorporate a description of the important role played by the artisan botanists of the 19th Century.

The habitats and ecology section will include details on soils, geology, climate and history as a means of explaining the current distribution of plants in the area rather than as separate sections in their own right. Biogeography was well covered in the previous Flora and a new discussion will be able to make comparison with the previous account.

The ability to draw future comparisons is also the rationale underpinning the proposed first section of the Flora. A largely overlooked area is the scientific value of Floras and the potential for detecting change in plant distribution and abundance (Hill 2003; Walker 2003). However, this will only be possible if precise details on how data was collected is clearly described.

The species details will cover the following taxonomic groups:

1. Vascular plants;
2. Bryophytes;
3. Marine and freshwater algae;
4. Fungi.

Initially it was hoped that lichens would also be covered but at the time of writing this seems unlikely. The groups that are included will be given different levels of coverage. Vascular plants and bryophytes will be dot-mapped at the tetrad level. Given the number of vascular plants (approximately 2200 species) and bryophytes (approximately 500) including casuals and extinct species, mapping all species will be precluded by space limitations. Therefore it is proposed to map only species which are present in six or more tetrads. This will reduce the maps required by

50%. Both the locations and the tetrad references will be given for those species which are not mapped.

There are around 1500 species of fungi recorded for the vice-county. However, the majority of fungi are detectable only when fruiting bodies are present. Such a sporadic appearance renders dot maps less meaningful for this kingdom. Therefore fungi will only be listed plus their special features and habitats. Lists will also be provided for the algal groups.

Of the microspecies aggregates, the *Rubi* have been extensively surveyed by local batologist Dave Earl. These will be presented as an Appendix to the vascular plants using the same criteria for mapping as the other vascular species, though with mapping at the 1 km square level. This will result in around 70 microspecies being dealt with. Such detailed coverage will be a highlight of the Flora.

The other critical groups (e.g. *Taraxacum*, *Hieracium*) will also presented in an appendix to the main vascular plant section but in a much less detailed manner than for *Rubus*, with a simple listing of the taxa recorded. This detail will reflect the level of knowledge of these groups. Aliens and casuals will be treated in the appropriate main account following Stace (1997).

A distinction between old and new records will be made on the dot maps or records. However, this raises the question of what constitutes an old record, as there are a number of possible cut-off points; pre-1958, the last field season of the Travis Flora (Savidge *et al.* 1963); pre-1987, to correspond to the 'old' records presented in Atlas 2000 (Preston *et al*. 2002), or pre-1995, the onset of recording for the current Flora. This criterion is still to be decided upon.

USES AND PROBLEMS OF THE DATA

Analysis of six years of records has started to reveal patterns and problems. Despite the problem in delineating old records it is apparent that some species are spreading. This is demonstrated by the distribution of two bryophyte species, *Ulota phyllantha* (Fig. 1) and *Orthotrichum pulchellum* (Fig. 2). These were both absent in 1963 (Savidge *et al*. 1963), never having been recorded within the vice-county. Hill *et al.* (1994), based on surveys undertaken from 1950, also considered both to be absent. Given the distinct appearance of these two species (most notably the large epiphyte *U. phyllantha*), it appears that this is a true spread rather than a product of recording intensity and reflects increasing air quality and availability of habitat. These two species are notable in their sensitivity to atmospheric pollution (Smith 1978).

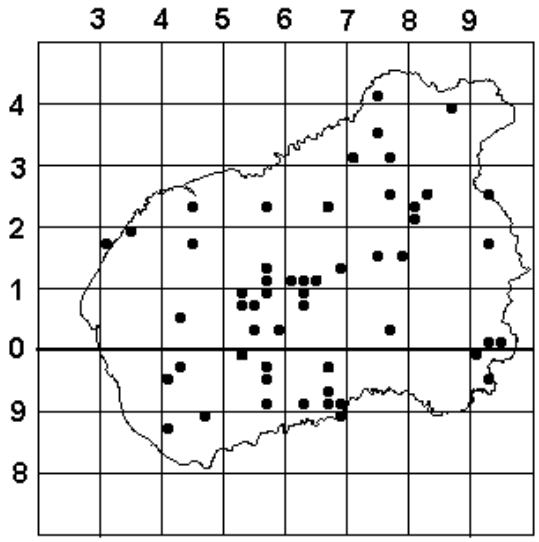

FIGURE 1. Distribution of *Ulota phyllantha* Brid. in v.c. 59 from surveys undertaken since 1995.

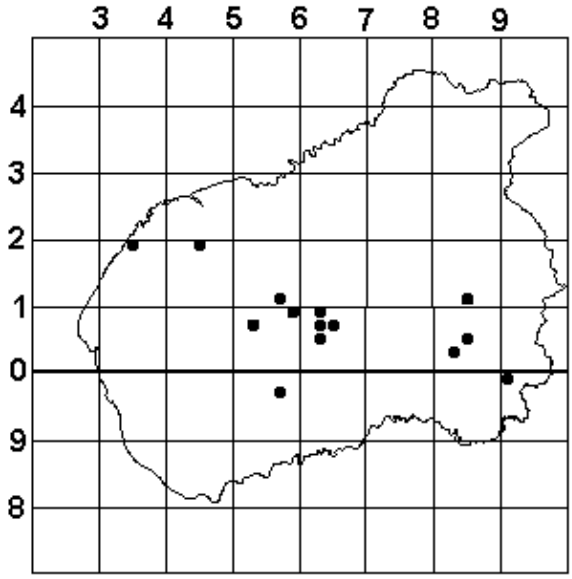

FIGURE 2. Distribution of *Orthotrichum pulchellum* Brunton in v.c. 59 from surveys undertaken since 1995.

Sufficient records now exist to compare the relative biodiversity within the vice-county. Unsurprisingly, vascular plant records show the tetrads covering the coastal dunes to possess most species, with those in intensive agricultural areas the least. Several urban areas also have high vascular plant diversity. Interestingly, this pattern is not completely repeated when bryophyte diversity is considered (Fig. 3). Here the coast is as poor as the agricultural areas, with the richest sites being in the highly populated ex-industrial areas.

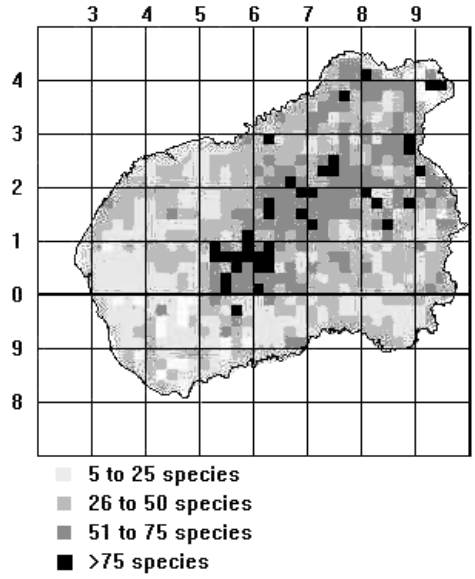

FIGURE 3. Bryophyte diversity in v.c. 59 revealed from surveys undertaken since 1995.

The presence of such variations in biodiversity may be due to the intensity of recorder activity rather than a reflection of the true pattern. Here, two approaches are briefly considered.

1. The distribution of ubiquitous species;

2. The relationship between cumulative species number and number of recorder visits.

It may be anticipated that certain conspicuous species will be found throughout the vice-county. Moreover, their obvious appearance means that they are unlikely to be overlooked. Within the vascular plants *Bellis perennis* and *Urtica dioica* may be considered to fall into this category. Similarly, the bryophyte *Brachythecium rutabulum* is extremely widespread and this is reflected in the distribution map in Fig. 4.

The few gaps in the distribution of this species may identify tetrads that have not been sufficiently visited. Alternatively, they may be areas that have been visited where the species is absent. As several bryophyte visits have been made to the appropriate tetrads in this case, a genuine absence of the species is suggested.

Such an approach will identify areas that have not received anything above a basic survey. However, once the common, easily identified species are recorded, a more sophisticated consideration of a tetrad can be made by considering the relationship between the number of visits or record cards from a tetrad and the cumulative number of species (see Fig. 5).

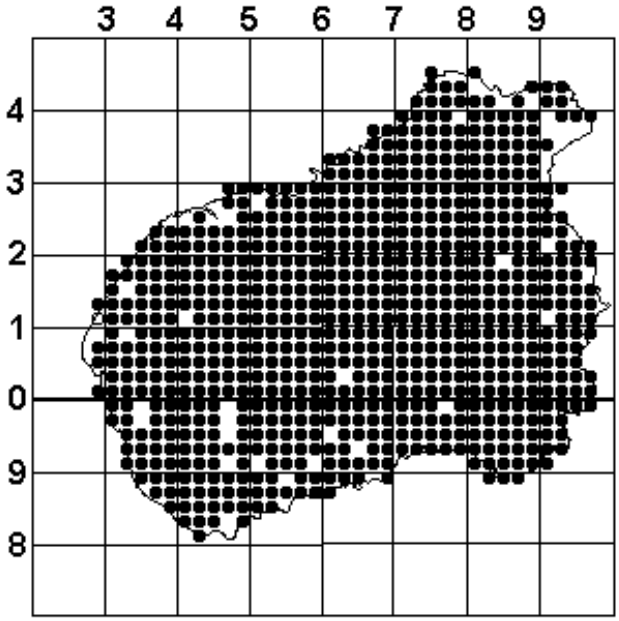

FIGURE 4. Distribution of *Brachythecium rutabulum* (Hedw.) B., S. & G. in v.c. 59 from surveys undertaken since 1995.

Initial visits to an area will rapidly increase the total number of species recorded in a tetrad. As the number of visits increases it becomes increasingly difficult to find new species. Therefore the graph begins to level off. Species-rich tetrads will have a higher final cumulative number of species than species-poor ones. Theoretically sufficient visits will identify all the species in a tetrad. However, given the dynamic nature of vegetative change this is likely to be a large number. More pragmatically, tetrads analysed in this manner, which reveal an ascending cumulative species number curve, are worthy of more intense future sampling than those whose curve gradient has started to flatten.

Once recording within a tetrad is complete the status of individual species may also require careful consideration. In particular, the distinction between native and introduced species can be confusing.

Consideration has been given to native status (e.g. Webb 1985) but on a national scale. Within v. c. 59 some species exist which are native in some areas and introduced elsewhere. This problem is most pronounced in trees. For example, *Acer campestre* is native within the small limestone area in the north-eastern part of the vice-county around Clitheroe. Elsewhere it is almost certainly planted. Such a clear geographic distinction is impossible with *Tilia cordata.* This is a rare native component of ancient woodlands in Lancashire but is increasingly incorporated into woodland creation schemes. Such problems will be addressed on an individual basis by the knowledge of the authors. Where such decisions have been made this will be explicit within the text.

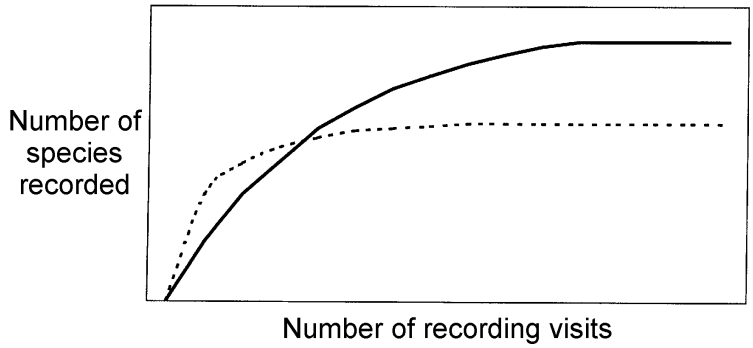

FIGURE 5. Effect of increasing the number of visits to a given area on cumulative number of species recorded. Key: (----) species-poor area, (—) species-rich area.

COMPLETION OF THE FLORA

The final field season for the Flora will be in 2003, the culmination of eight years fieldwork, with publication in 2004 or 2005. While it is recognised that the data are likely to leave many questions unanswered, it is important that publication is achieved as rapidly as possible. Otherwise the aim of producing a picture of the flora around the turn of the millennium within its historical context will not have been achieved. The questions still to be answered may act as a focus for future investigations.

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