Progress with the Fenland Flora in 2019 (-2020!)

Owen Mountford and Jonathan Graham

And now the work really begins

There is a popular football chant – "it's all gone quiet over there" – usually meaning that one set of supporters note their vociferous opponents are suddenly subdued when their team has a setback. Our colleagues, collaborators and interested parties may perceive a lack of recent noise from the *Fenland Flora*, at least in terms of new surveys and records submitted to BSBI vice-county recorders in 2019 (and early 2020). However, that reflects neither a setback nor a lack of activity but rather that we have had our heads down making sure that the flora database is as complete and accurate as possible, and ready for the analyses that are the preamble to writing the species accounts. It should be admitted that the special circumstances of 2020 (Covid-19 *etc*) have required us to pay more attention to what we have already than to being outside and gathering new data. Insofar as this pandemic can be said to be "well-timed", it did arrive after our main field campaign was complete. For Owen, in Bucharest and unable to get a flight to Britain, it has removed any excuse for displacement activity and means that, although Fenland has occupied much of his waking hours, it has all had to be at the laptop rather than in the field.

There has been considerable new fieldwork, especially in 2019 but also into the spring of 2020 (as far as allowable), with surveys targeted on those parts of Fenland with fewer records than we'd expect or where species that should be ubiquitous are unrecorded. In addition, from the very outset, our surveys have placed special attention on drainage channels, whose aquatic habitats and banks make a distinct contribution to the survival of what we might consider the original Fenland species. Jon in particular has recently made wide-ranging surveys of field ditches and bigger drains, grappling their depths where necessary to make sure that any gaps in our maps reflect probable real absence and not a lack of effort. Searches for former locations of rarer Fenland plants have continued and will do so as long as the results can be incorporated in the written flora.

Anyone who reads these annual reports in sequence will see that plans and milestones are seldom met in their entirety each year. As we noted last year, wise heads among flora writers had counselled us that each stage always took longer than one would hope. However, by the spring of 2020, all the field data (2000 onward) and historical data (pre-2000) we need are in the database and the next stages (analysis, map-production and writing) are ready to go.

Fenland botanists – past and present

The past year has seen the publication of Alan Leslie's masterly *Flora of Cambridgeshire* which, among many features, contains a full account of those botanists to have contributed over the decades to knowledge of that county's flora, including the southern part of the Fenland basin. A major part of our own 2019-20 activity has been to marshal information on the Fenland flora from before 2000. This exercise has been a lesson in humility. One of our motives in stimulating and eventually publishing the *Fenland Flora* has been to redress the balance in recording intensity over the region, helping to "fill the gap" in Fenland. It remains true that Fenland has received less attention than adjacent parts of its

component counties, but our area was by no means a botanising void, a *terra incognita*. Thus, in our flora we will also pay due regard to the numerous botanists who gathered records in Fenland. A particularly important period comprises the post-World War II decades (1945-1999), when ease of transport and the growth of bodies such as the BSBI, the Wild Flower Society and Wildlife Trusts led to naturalists travelling to out-of-the-way parts of Fenland to record plants.

Some pioneering botanists of this post-war period in Fenland are still active and one, Arthur Chater, is responsible for what is undoubtedly one of the best (if not the very best) county floras ever produced (*Flora of Cardiganshire* 2010) but he cut his teeth, as it were, visiting remote parts of Fenland in the 1950s for the original *Atlas of the British Flora* (1962) and the 1964 Cambridgeshire Flora. Some have left evidence of their activity in Fenland in the shape of county floras covering part of Fenland: Joan Gibbons and latterly Irene Weston in Lincolnshire; Charles Petch, Eric Swann, Gillian Beckett and Alec Bull in Norfolk; Francis Simpson in Suffolk; Franklyn Perring, Peter Sell, Max Walters and Harold Whitehouse in Cambridgeshire; John Gilbert and then Terry Wells in Huntingdonshire (as well as the Soke of Peterborough vc 32); and Gill Gent and Rob Wilson in Northamptonshire. Many of these were BSBI vice-county recorders, and our own project has depended hugely on input from their modern-day equivalents: Paul Kirby, Sarah Lambert, Richard Carter (and Bob Ellis), Martin Sanford, Jonathan Shanklin, Alan Leslie, David Broughton and Alyson Freeman, as well as in the recent past Nick Millar, Charles Turner and Derek Wells.

Some recorders are maybe more associated with areas away from Fenland, such as P.J.O. Trist, whose Breckland Flora is to some extent an inspiration for our work. Together with Marg Rutterford, Yvonne and David Leonard, and Enid Hyde, John Trist ensured that the Suffolk Fenland was actually quite well recorded in the 20th century, especially where it graded into Breckland. Similarly Elizabeth Norman, and Miss M. Stokes produced long lists for the Cambridgeshire fens. The name "R. Payne" keeps cropping up in inventories from the southern Fenland but covers the work of two outstanding botanists. S. Robert Payne covered much of the vc 29 Fenland, and was especially good at getting to remote areas in the north of Cambs. Ron M. Payne made it his goal to document the flora of the urban parts of the Cambridgeshire fens, publishing his *Flora of Ely* in 2002, but gathering similarly detailed material on all the towns and most of the villages during the first years of this millennium. Ron's notebooks are held by Alan Leslie who kindly loaned them to us, as one of several major data-mining tasks we undertook in 2019.

It is possibly in Lincolnshire where the contribution of local botanists was most clearly pivotal in the 20th century, as this county had no university at that time and a sparse population in Fenland. The contribution of the Lincolnshire Naturalists' Union (LNU) in stimulating activity was crucial and many of the most productive botanists were involved in both the LNU and BSBI *e.g.* William M. Peet, Kay Heath, Vyvyan Pennell, Zella Harris, Brian Redman and M.N. Read. Our own fascination with drainage channels is aided by a large number of river and drain surveys that took place in the 1990s, especially in Lincolnshire where the name "J. Clayton" is prominent. John Redshaw's contribution began in the mid-20th century and continues up to the present, especially in vc 53 but covering the whole of the Lincolnshire Fens. The importance of having active recorders locally based is beautifully shown by the abundance of data for the Washingborough area from the Bindings (A. & A.E.).

There are very many other botanists covering the period from the late 16th century through to 2020 that deserve mention – the selection above is short, somewhat arbitrary and omits people who must await the published *Fenland Flora* to receive proper and fitting acknowledgement. Two names, however, cannot be left out of this account of 2019-20 due to their extraordinary role in Fenland botany and to the fact that, very sadly, they died during this last year.

Gigi Crompton was BSBI recorder for vc 29 and, together with Harold Whitehouse, Graham Easy and Alan Leslie, she produced a checklist for the county in 1983. Alan has written an obituary of Gigi that

reflects a great life well-lived but, for our own parochial interests, it is her catalogue of Cambridgeshire Flora records since 1538 that represents her greatest legacy. Through dogged determination and scholarly rigour, she put together this searchable catalogue that is maintained on the web now by *Nature in Cambridgeshire*, including all the records she could find from the historical sources as well as many important relatively modern (1950-early 2000s) observations. No other county in Fenland has such a resource. Because of the presence of the university and pioneers like John Ray, there is a greater wealth of material over a longer period for Cambridgeshire than other Fenland counties but it was Gigi's gift to all of us to make that material instantly available (see later description of database activity).

Robin Stevenson died early in 2019 having made a unique contribution to Fenland botany. As we stated last year, his focus on the east shore of the Wash north of King's Lynn and on Lynn itself (see his 2011 Flora written with Frances Schumann) meant that this part of Fenland, which (relative to the rest of our study area) is a bit out on a limb, received thorough and expert coverage. He acted as a mentor to other botanists, notable Lewis Saunders, made a special study of Bryophyta, particularly in the orchards which had been such a feature of the Lynn-Wisbech area and had a real understanding of the geology and soils of Fenland *etc*. He was also a stimulating and highly amusing companion on surveying trips with both Jon and Owen – anecdotal stories involving Robin are still regularly exchanged by his fellow botanists underlining how much he is missed.

The "home" of the *Fenland Flora* – looking toward Whittlesey over the flooded Nene Washes in December 2019 at the end of the main field campaign © Jon Graham

Fenland botanical highlights from 2019 (and early 2020)

During 2019, we visited all the remaining tetrads that had a low record total, except for the problematic **TF43H**, which is entirely saltmarsh and north from Lawyers' Farm, Holbeach St Matthew. This area is part of the MoD ranges and all our visits have been when the red flag is flying! We're still trying. We had circulated lists of our priority tetrads to all major collaborators and this helped greatly in together meeting our coverage goal. In one particular area, on the seaward side of the A52 at Wrangle, the result was that both Paul Kirby with Colin Hutchinson and Owen turned up separately within days of one another in September. Features that attracted both surveyors were the very colourful and species-rich pollen and nectar strips that surrounded a group of maize fields owned by the *Staples* company (see photographs). Owen's list tallied very closely with Paul and Colin's but not completely and showed the advantage of more than one pair of eyes and more than one visit. The sheer size of Fenland, coupled to the rather small number of active recorders, has meant that some of the more distant tetrads have only been visited once, possibly resulting in a seasonal bias in the plants recorded. Certainly, we acknowledge that there will be unavoidable gaps especially among the less frequent species recorded in such tetrads. However, every county flora is of course incomplete on publication, begins to date at once and throws down a gauntlet to add new records!

We have frequently stressed the importance of the drainage channel network to the survival of aquatic and wetland plants in Fenland, and the role of the Environment Agency and the IDBs (Internal Drainage Boards) in the management and conservation of such sites. During the 1990s, channel surveys were commissioned in many parts of Fenland by the National Rivers Authority (after 1995 the Environment Agency). Partly as a result, several drains were designated as Local Wildlife Sites (even nature reserves) and in the 21st century nature conservationists took on the surveying and monitoring of these higher quality drains. In terms of intensity of survey, however, the work of Richard Lansdown in the southwestern fens of Lincolnshire stands out. Especially detailed in hectads **TF11-TF14**, but also covering parts of **TF20-TF24**, he achieved unrivalled coverage of the ditch and drain flora and confirmed this part of Fenland as an important refuge for scarce aquatic plants.

From 2012 onward, we have given numerous talks on the *Fenland Flora*, often illustrated with provisional distribution maps of selected species. For aquatic macrophytes, these maps suggested that the inner Fenland retained a relatively rich flora of aquatic plants whereas the silt-lands closer to The Wash were very poor in species. There were also surprising gaps in the mapped distribution of some such plants further inland. Conscious that our tetrad-based surveys needed further targeting on key habitats, in 2018 but especially in 2019, Jon made surveys in these areas, largely confining his attention to main drains, IDB drains and wet field ditches in an attempt to discover whether the gaps were real or an artefact.

There are at least 50 plant species which should be present in all Fenland tetrads, except those that comprise only saltmarsh and mud-flats. In other words, we would expect "dot-maps" to be solid black. Yet, there were apparent gaps, even for species such as False Oat-grass (*Arrhenatherum elatius*)! Fortunately, filling the gaps for these "desiderata" was not too onerous – one simply travelled to the tetrad, stepped out of the car, checked the grass verge and the crop headlands and there indeed were the missing species. Plant survey is not always an exact science and all botanists have sometimes omitted the obvious and ubiquitous, maybe as a result of searching for the strange and special. We hope that the number of these apparent absences has been reduced to a minimum by the effort in 2019, but no doubt some remain.

Wildflower strip by maize: Staples at Wrangle September 2019 © Owen Mountford

***Cosmos bipinnatus* in a wild flower strip: Staples at Wrangle September 2019 © Owen Mountford**

Many new records have been submitted and even some new species have been found in Fenland in 2019, though especially among the non-native flora. Several of the BSBI vice-county recorders (VCRs) have been very active, with Paul Kirby making surveys along the northwest side of The Wash at Benington Seas End and Friskney, as well as at Wrangle. Paul was part of the LNU group that surveyed Boston cemetery in August finding an interesting mix of planted woody species and both native and non-native herbs in a site that has been a productive botanising ground for several decades. Sarah Lambert made Fenland forays in both South Lincolnshire and Northamptonshire, the latter around Peakirk *etc*. She led the South Lincolnshire Flora Group in a late summer visit to the Surfleet area finding, among several good things, abundant Hairy Buttercup (*Ranunculus sardous*) in damp grassland. Considering its relative abundance in North Norfolk and near the Humber, this buttercup is surprisingly rare in the coastal region of Fenland but it does have strongholds at Surfleet and near Snettisham (Norfolk) and was found by Jon in May 2020 in a ditch by the A16 near Crowland. David Broughton produced some very useful surveys of the Earith-Colne area, helping to define which species and sites are Fenland and which not. Last but definitely not least, Jonathan Shanklin made numerous surveys in Fenland, attempting to bring monads and tetrads up to scratch as far as species totals recently recorded is concerned. He also wandered from Cambridgeshire into both West Norfolk and South Lincolnshire, as well as Huntingdonshire.

Apart from the VCRs, probably the biggest single contribution in 2019 to coverage of the Fenland came from Tim Inskipp, the results of whose surveys were passed to us by Jonathan Shanklin. Tim will be known to many naturalists from his ornithological books on South Asia and for his work with the UN Environment Programme World Conservation Monitoring Centre based at Cambridge. In terms of the *Fenland Flora*, he had already made key surveys of the Ely area and of the Ouse Washes but in 2019 he went out into some of the less appreciated parts of the Cambridgeshire fens and did some solid "tetrad-bashing". His coverage was especially intensive in the area between March, Chatteris, Welney, Littleport and the Norfolk border (**TL48, TL49** and **TL59**) but his journeys covered parts of **TL47** and **TL57** (Witchford *etc*), **TL68** (Little Ouse) and **TF40/50** (Elm, Outwell and Upwell).

Jersey Cudweed (*Laphangium luteoalbum*) at Chapel Road Wisbech © Lewis Saunders 2019

***Salicornia fragilis*, TF4509448647, E of Hurn's Leake End (Wrangle Flats), Middle and Lower saltmarsh, JJG, 27 August 2019**

It is good to note that there are also botanists newly active in Fenland. Records from Adam Lucas first arrived in 2018 but with increased activity in 2019 in Lincolnshire, especially in the Boston area where his observations of established shrubs and non-native plants have made some interesting additions, such as just the 5th site in Fenland for Giant Knotweed (*Fallopia sachalinensis*) in a patch by the Maud Foster Drain. It is especially heartening to mention Lisa Mason who is based by the Roman Bank near Moulton Seas End – probably as "deep-Fenland" as is possible! In 2018 she recorded the very uncommon Nettle-leaved Goosefoot (*Chenopodium murale*) near her home and has followed this up with a study of her local dandelions in 2019-20 (see below). Fenland needs all the botanists it can muster actually resident in the area. Lewis Saunders's career now means he spends a lot of time away from his Wisbech home but, with Alan Leslie, he still managed to find the Iranian Germander (*Teucrium hircanicum*) right on the Fenland edge near Soham in what appears to be the first localised record for its growing wild in Britain. Closer to his home, he found Jersey Cudweed (*Laphangium luteoalbum* – once *Gnaphalium luteoalbum*) at the edge of a car park in Wisbech. Once a wild plant of Breckland, and still with native locations on the Norfolk Coast, near Dungeness and, of course, on Jersey, this cudweed has begun to turn up in waste ground usually in urban areas. All its other Fenland sites are in Cambridgeshire, at Parson Drove and Stretham, and it is a street weed in Cambridge city too.

As the *Fenland Flora* survey progressed, more attention has been placed on the critical groups. Hawkweeds (*Hieracium* species) are very rare in Fenland, as are eyebrights (*Euphrasia* species), and almost all records have been authenticated by specialists. The same cannot be said about brambles (*Rubus*) but here the work of Alan Leslie in Cambridgeshire and Alec Bull in Norfolk has given us some idea of the microspecies we have. Two of the most eminent batologists, Eric Edees and Alan Newton, made visits to Fenland in the late 20th century or worked on specimens gathered by local botanists. Flora groups in Lincolnshire, Norfolk and Cambridgeshire have encouraged some interest in brambles and the distribution of two distinctive taxa (*Rubus armeniacus* and *R. ulmifolius*) is now quite well recorded. In the saltmarshes of The Wash, Glassworts (*Salicornia* species) are common and diverse. Many of the records are at the genus level, or refer to *S. europaea sens. lat*.. Some observers have identified particular species, especially *S. dolichostachya, S. obscura* and *S. ramosissima* but also the much rarer *S. emerici* (by James Cadbury at Freiston in 2010) and probable *S. fragilis* also along the Lincolnshire coast in at least five sites – see Jon's 2019 montage of material from Wrangle Flats above.

Fenland is fortunate to have been the region where pondweeds were first critically studied in Britain by Alfred Fryer of Chatteris, Arthur Bennet and in the modern era by Chris Preston (Cambridge). Willows have also received fairly detailed attention, including visits in the 20th century by R.C.L. (Leaver) Howitt, especially to Lincolnshire. However, it was probably only with the multi-access keys drafted by Clive Stace that many observers tried to get to grips with poplar cultivars and hybrids. Until then many black poplars were dismissed as *Populus nigra sens. lat*. or *Populus x canadensis*. The narrow spires of "Lombardy poplars" are a feature of many Fenland landscapes and until very recently almost all observers recorded them as *Populus nigra "Italica*". However, in 2019 Paul Kirby made a critical reassessment of such trees in North Lincolnshire and showed that the vast majority are either *Populus nigra 'Plantierensis'* or *'Gigantea'*. Indeed he believes that the evidence is that '*Italica*' may at best be very rare over Fenland as a whole.

Taraxacum anglicum (conf. John Richards), TL22558357, J. Graham & P. Stroh, Woodwalton Fen NNR, 24th May 2018, wet pasture with *Hydrocotyle vulgaris* and *Calliergonella cuspidata*.

Of all the critical genera in Fenland, dandelions (*Taraxacum*) are probably the most ubiquitous, especially those of section *Ruderalia* on waysides and improved grassland. Although a BSBI identification guide was published as long ago as 1997 (Dudman and Richards), many observers were daunted by the apparent complexity of the keys, the "fiddly" nature of preparing herbarium sheets or the short period of the year when plants could reliably be identified. The situation has improved greatly in recent years, the keys made more user-friendly and John Richards has identified material from photographs, especially if they are in the form of montages that show all the key features of fresh material, such as that for *Taraxacum anglicum* included here. Since April 2019, there has been a flurry of dandelion-based activity. This began with a BSBI meeting at Wicken Fen *etc*, led by Tim Rich and with material checked by John Richards. This single foray showed that at least 12 species in addition to the well-known *T. palustre* were present at Wicken: *T. akteum, T. boekmanii, T. disseminatum, T. haematicum, T. hamatulum, T. hamatum, T. mimulum, T. obtusifrons, T. oellgaardii, T. polyodon, T. pruinatum* and *T. sellandii*. In Lincolnshire in spring 2020, Lisa Mason found *T. leucopodum* and *T. pseudohamatum* in her garden lawn, having identified the material herself first and then had her determinations confirmed by John Richards. Similarly, Jon made dandelion records in the Whittlesey area, finding *T. porrigens* in two places and *T. subexpallidum,* as well as *T. lacerifolium* near Manea. Some of these 2020 records by Lisa and Jon are new to the vice-counties, although it has to be admitted that they were likely overlooked in the past. The same cannot be said about *T. anglicum*, a speciality of old wet grasslands, which E.W. Hunnybun had found at Port Holme near Huntingdon in 1910 (not Fenland), and with other Fenland records at Bottisham (1839), Wicken (1935), as well as Shelford Common off Fenland in 1826-1832. Pete Stroh and Jon identified it at Woodwalton Fen NNR in May 2018, but the record was only confirmed by John Richards over the winter of 2019-20. There is clearly plenty of work to be done and special plants still to be found even on grotty Fenland verges.

The discovery of the rare dandelion at Woodwalton and of numerous other *Taraxacum* species at Wicken reminds us that even the best known sites in Fenland have new taxa to be discovered. One of the best known plants at Wicken is the Comfrey (*Symphytum officinale*) which typifies the special tall-herb rich-fen for which Wicken is famous: **S24c** *Phragmites australis-Peucedanum palustre* tall-herb fen *Symphytum officinale* sub-community. Despite this, no-one had confirmed that the particular comfrey found at Wicken was the Fenland speciality *S. officinale subsp. bohemicum*. In July 2019, Richard Milne (Edinburgh University) visited the fen and made some biometric observations of the comfreys which suggested that all the plants were indeed subsp. *bohemicum*. Absolute certainty requires a chromosome count, but this surprising omission from the list of Fenland's best known site appears to have been filled. Prior to retiring as the ecological and conservation advisor to the Eastern Region of the National Trust, Stuart Warrington sent another batch of records for the Trust's land. The Wicken database contains records for over 9000 species of plants and animals, and the detail for vascular plants is exceptional but there are still additions to be made. Generally we have found that the Sharp-flowered Rush (*Juncus acutiflorus*) is very rare in Fenland and usually found in sites at the edge of the basin. Past records from Wicken have been doubted, but in recent years several skilled botanists have recorded it beginning with Geoffrey Wilmore in 2006, Lynn Healey in 2007 and by Alan Leslie and Pete Stroh in 2015 (confirmed by Mike Wilcox). Stuart's 2019 data includes records on the Sedge Fen, as well as the hybrid *J. x surrejanus* (by Richard Lansdown) on Adventurers' Fen.

Bryophytes

Surveys focussing on bryophytes were concentrated during the winter months, and covered much of Fenland with a view to understanding their habitats locally. Attention focussed especially on Lincolnshire and Cambridgeshire , but West Norfolk (vc 28) was targeted by Jon in April 2020 with visits to **TL6791** (the Feltwell Common area) and **TF5416** (around Terrington St John).

Lincolnshire remains the most under-recorded part of fenland and so Jon and Chris (Preston) made a good number of visits to poorly worked Lincolnshire tetrads targeting churches, arable land and older ditch banks. Jon visited **TF23** in January 2019, the Kirton Holme area (**TF24**) in November 2019 and the Holbeach St Johns area (**TF31**) in April 2020. Typically, these visits provided some new records (at tetrad level) of a small number of common and widespread species.

Chris and Jon also made visits to Sutterton Church (**TF2835**) in January 2019 which provided useful records of *Didymodon luridus, D. sinuosus, D. vinealis, Fissidens taxifolius* and *Plagiomnium undulatum*; *Bryum radiculosum* was noted on the brickwork of a bridge (Sutterton Dowdyke) and the mortar of a church wall (Algarkirk Church, **TF2935**) along with *Hygrohypnum luridum* and *Pohlia nutans*. A visit to a plantation at Kirton Meeres (**TF291384**) produced *Eurhynchium striatum* along with the epiphytes *Cryphaea heteromalla, Metzgeria furcata* and *M. violacea*. They also visited Freiston, Fishtoft and Butterwick (**TF34**) in November 2019 focussing mainly on the churches. *Didymum rigidulus* was an interesting find (Freiston Church) but more noteworthy were *Didymodon nicholsonii* and *Microbryum davallianum* (Butterwick Church) and *Tortula modica* (Freiston). Additionally, the small weedy species *Tortula protobryoides* was found at the edge of a layby nearby.

Jon and Owen visited the Dawsmere area (**TF23**) in February 2020 principally to pick up records of early spring flowers and planted bulbs but found time to record bryophytes from more promising habitats. Of note was Christ Church, Dawsmere (**TF4430**) where 21 species were recorded (rich by fenland standards) included worthwhile records of *Fissidens taxifolius* (on clay soil beside graves) and *Bryoerythrophyllum recurvirostrum.*

(Left) *Lophocolea semiteres* (Stanground Wash), (right) *Thuidium assimile* (Bassenhally Pit) © Jon Graham 2020

vc29 (Cambridgeshire) was targeted by Chris and Jon in January 2020 when they went to Stanground Nature Reserve (**TF29**) specifically to revisit the short (acidic) heavily rabbit-grazed grassland on old railway ballast (a habitat scarce in fenland). A search of the more open areas of ballast found *Polytrichum juniperinum, Dicranum scoparium, Rhynchostegium megapolitanum*, the tiny leafy liverwort *Cephaloziella divaricata* and a large quantity of the liverwort *Lophocolea semiteres* (a new vice-county record). Other interesting records included *Aulacomnium androgynum* (on rotting worked timber) and *Eurhynchium striatum* (by a path through scrub). They later visited a variety of habitats south of Whittlesey finding notable large populations of *Fissidens viridulus* (shaded clay banks of Bundy's Pit, **TL2895**) and *Rhynchostegium megapolitanum* on a verge of Ramsey Road (B1040), **TL2695**.

A planned visit to Bassenhally Pit (**TL29**) by Cambridgeshire bryologists was cancelled firstly due to a forecast of extreme winds and secondly due to Coronavirus restrictions. Jon was eventually able to visit this important site on his own in March 2020. This visit provided updated records of known historically important species (*Campylium protensum, Ctenidium molluscum, Fissidens adianthoides, Thuidium assimile*) as well as valuable new records of *Thamnobryum alopecurum* and the tiny epiphytic liverwort *Cololejeunea minutissima*. In that month, Jon also made solo surveys of the Euximoor Fen area, SW of Upwell (**TL4797**), finding an interesting record of *Fissidens taxifolius* (ditch bank in an open very improved area of fenland) while Jonathan Shanklin recorded bryophytes during a visit to Mepal outdoor centre (**TL4283**) that included a useful record of *Pellia endiviifolia*.

Completing the database and the importance of historical records

During 2019-20, our focus changed from gathering new field data to searching out and assembling records from databases, herbaria and publications. This compilation involved a few major sources and numerous minor sources. In each instance, the process involved checking the accuracy of each record, confirming that it actually refers to a Fenland site, and that where possible that site could be localised at least to a tetrad with the date rendered as precisely as possible. This exercise underlined the richness of Cambridgeshire in terms of historical sources. For other vice-counties, the databases of the BSBI, both nationally and with the VCRs, represent much the most important data source and many recorders have compiled historical records into their databases.

In his capacity as vice-county recorder and especially when preparing his recent flora, Alan Leslie holds several very useful resources. Prior to his 2019 flora, the last full account of the county was the 1964 flora by Franklyn Perring, Peter Sell, Max Walters and Harold Whitehouse. That flora was prepared in parallel with the first *Atlas of the British Flora* and both works reported at a hectad scale. However, the field surveys in Cambridgeshire were generally prepared on cards for individual monads. The main recorders in Fenland during the 1950s were Arthur Chater and Frank Perring. Alan loaned these record cards to us and we compiled them in a separate workbook before incorporating the information into the main Fenland Flora Database (FFDb). As with other such compilations, a copy of the workbook was disseminated to all the main interested parties, in order that they too could have instant access to the information for county- or nationally-based projects.

The notebooks of Ron Payne (also held by Alan) have already been mentioned. Strictly speaking, these records are not "historical" as Ron conducted his fieldwork within the modern *Fenland Flora* recording period, specifically 2001-4 (though precise dates are not included). He had a particular interest in the flora of walls and pavements, and although his accounts of the Fenland towns (Chatteris, Ely, Littleport, March, Whittlesey and Wisbech) hold the greatest number of records, his travels took him to the smaller villages and even isolated pill-boxes out in the agricultural countryside. The hand-written notebooks, arranged by location, include habitat information and sometimes precise grid references. His main location information comprised town/village and street name. In most cases, this can be

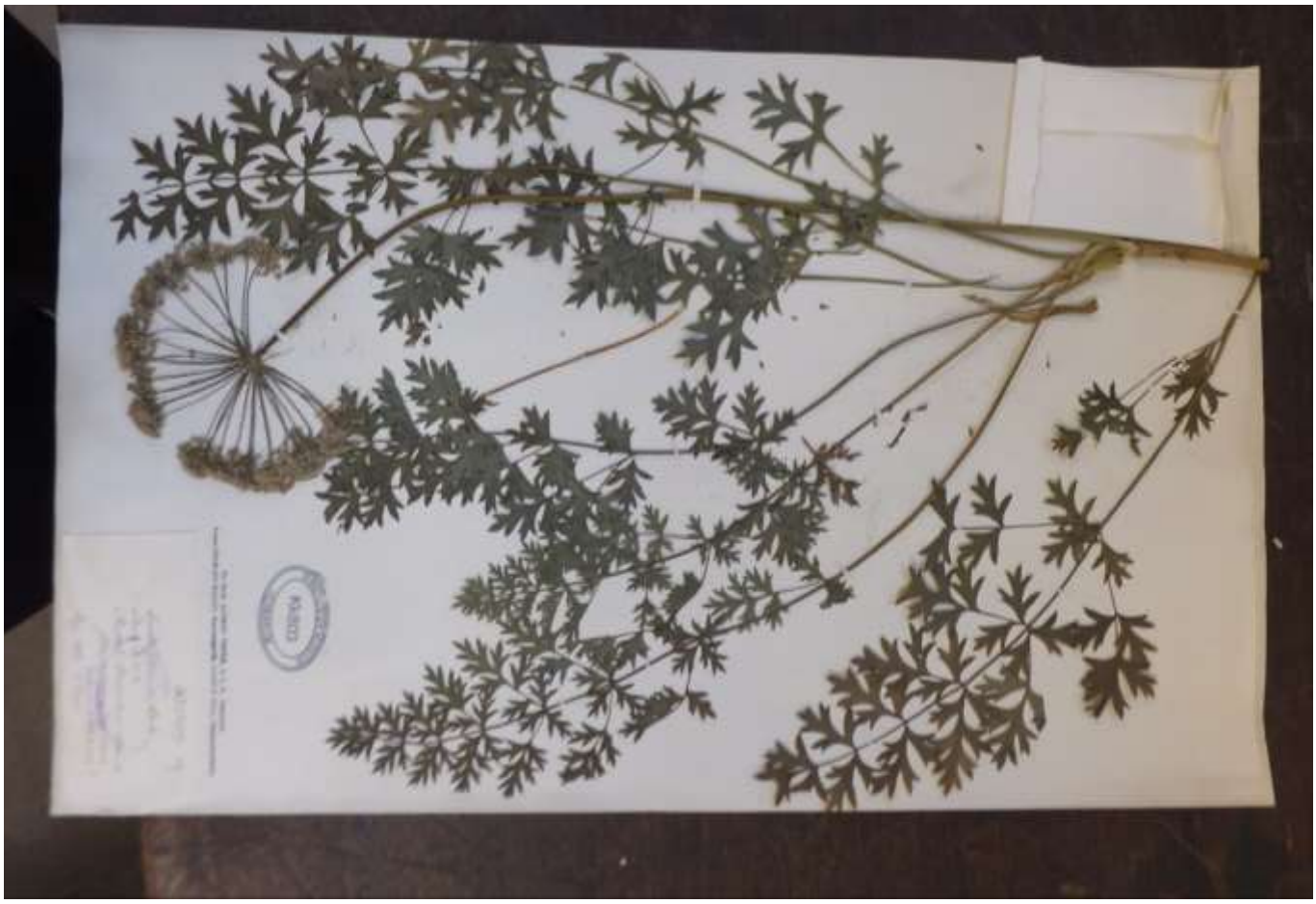
readily converted to a tetrad (or better) but in some cases where a road crosses a boundary between tetrads, we either had to repeat the record for both units, or infer where exactly it might be found.

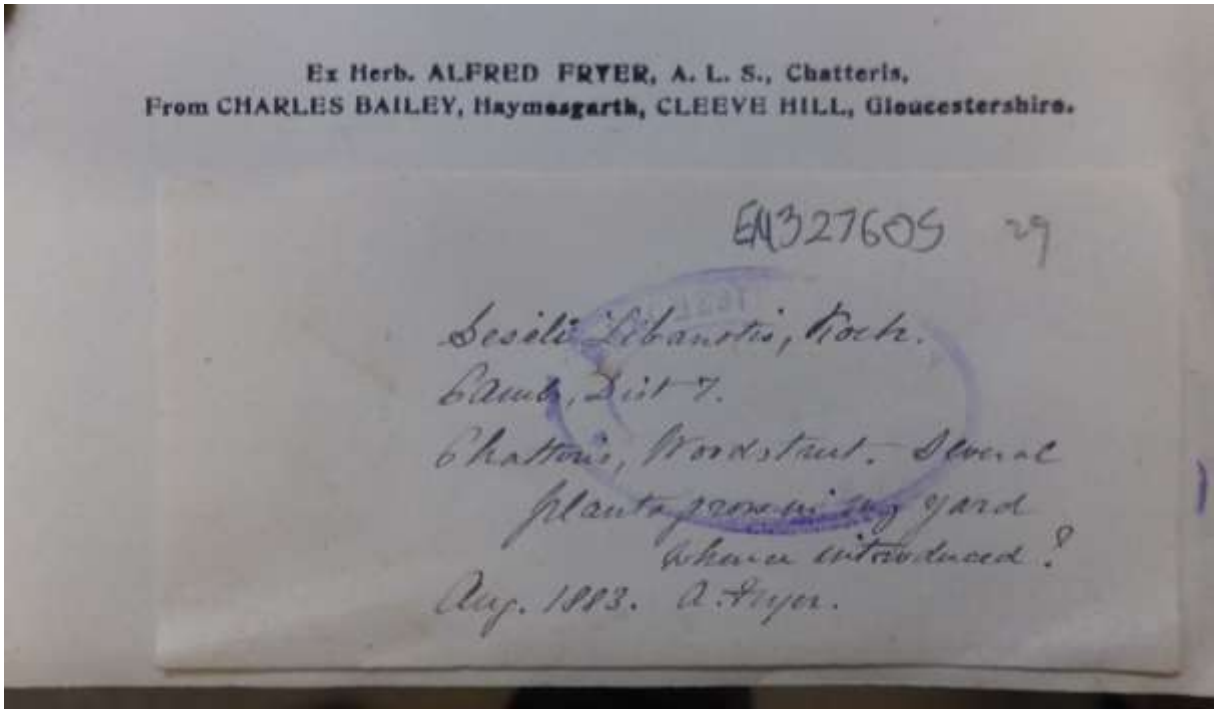
In 2019, the biggest data abstraction and compilation exercise was to work our way through Gigi Crompton's catalogue of Cambridgeshire Flora Records since 1538 – outlined above in the discussion of Fenland Botanists. Clearly, this information was in the public domain and it had been Gigi's goal to make this resource available to everyone with an interest in the wild plants of the county. However, one could not make a simple download from the on-line database into an Excel workbook and in any case, some of the information required further detective work to localise the records to a tetrad. Therefore we again manually compiled a workbook, with accompanying explanatory text, to include all the records from the catalogue that referred to Fenland. The final workbook was distributed among other Cambridgeshire botanists for their use. Although some of the records (such as Ron Payne's Ely data) were for the 21st century, the historical data were the chief components. Gigi had examined all the herbaria known to hold Cambridgeshire material. She had also been through papers, record-books, published floras (and personal annotated copies) and card indices – literally 100s of sources. Her catalogue account for each species is arranged by hectad but we were able to convert many records to tetrad level, using her excellent gazetteer of place names. In some cases, we had to use our own judgement as to location but the output workbook clearly states where our interpretation has guided the compilation. Many of the records from the catalogue were already in the BSBI DDb but, at least for Fenland, we believe ours is the first comprehensive transcription of this treasure trove to a format that can be analysed.

Gigi Crompton's catalogue is a brilliant and unique work that saves the flora writer from having to work through every published floras *etc* – especially important in a county where the published accounts are so numerous. In other Fenland counties, such as Lincolnshire and Huntingdonshire, BSBI recorders have often transcribed records from the main floras into their own databases and hence into the BSBI DDb. For example, the late 18th century writings of Joseph Banks and Arthur Young on the "peaty bogs" of the great East Fen in Lincolnshire were incorporated in Joan Gibbons's 1975 *Flora of Lincolnshire*, the first comprehensive account of the plants of that county. Over the past 50 years, Owen had gradually collected copies of all the county floras that covered the Fenland and we examined these to make sure that the data were "in the system". Further older sources can be traced through N.D. Simpson's *Bibliographical Index of British Flora* (1960).

For Norfolk and Suffolk, we conducted an exercise examining the classic floras to ensure that all Fenland material was accounted for. Thus, we compiled a workbook for Norfolk based upon the records in Kirby Trimmer's *Flora of Norfolk* (1866) and that of Nicholson (1914). The clearest conclusion coming from that exercise was how few records had been gathered in the nineteenth century for Fenland. Focussing on those hectads wholly or largely in Fenland, the totals numbers of records are dispiriting: a) **TF41** (Walsoken and the Waltons): 54 records; b) **TF50** (Nordelph, Stow Bardolph and Marshland Fens): 19 records; c) **TF51** (Marshland – Terrington, Tilney, Wiggenhall): 16 records; and **TF52** (Terrington Marsh and the Wash shore): nothing. In contrast, there were hundreds of records for those parishes along the east edge of Fenland. In some instances, we could conclude (or at least infer) that these "Fenland edge" records referred to our study area but in many cases, it is likely that they described sites on the uplands. A similar picture emerges from W.M. Hind's *Flora of Suffolk* (1889) with huge numbers of records for the hectads straddling Breckland and Fenland (**TL77** and **TL78**), some at least of which can be ascribed to Fenland sites such as the floodplain of the Lark or Lakenheath Fen. However, for Mildenhall Fen *etc* (**TL67**) and Sedge Fen *etc* (**TL68**), the total numbers of records are just 22 and 3.

From Gigi Crompton's catalogue, the importance of Alfred Fryer in the history of Fenland botanising becomes forcibly apparent – it is not fanciful to call Fryer the father of Fenland botany. In preparing his books on pondweeds and on aquatic plants, Chris Preston had looked at Fryer's herbarium material





Moon Carrot (*Seseli libanotis*) from Alfred Fryer's herbarium – presumed accidentally introduced in the yard of his house in Chatteris – Manchester Herbarium sheet and label © Chris Preston 2020

on *Potamogeton*, and Dick David similarly had looked at *Carex* – the results of these searches being incorporated in Gigi's catalogue. Although some of Fryer's collections had been lodged in the British Museum, a good part of his herbarium had been divided (apparently by plant family) between the universities of Manchester and Oxford. Chris and Owen spent 3 days in these herbaria in February looking for Fryer sheets and recording what they showed. At Oxford, we focussed on monocots, especially *Poaceae* and *Juncaceae*, whereas in Manchester we covered *Amaranthaceae* (including *Chenopodiaceae*), *Apiaceae, Caryophyllaceae, Hypericaceae, Lamiaceae, Malvaceae, Polygonaceae* and a few minor families. We intended to return at Easter but Covid-19 intervened and the search remains incomplete.

The last and largest element to be incorporated within the Fenland Flora Database (FFDb) comprises the national data held in the BSBI Distributional Database and managed by the Biological Records Centre at CEH Wallingford. We produced guidelines on what was and what wasn't Fenland and sent these to Wallingford, together with an account of what we'd already received from VCRs and record centres *etc*. Tom Humphrey and Oli Pescott then assembled the Fenland data in workbooks by vice-county, divided into records that could be localised to a 5km x 5km square or better (usually at least tetrad) and those stored only the hectads. We received these data in January 2020 and then worked on them for the next 3 months! The main task comprised checking that these were each indeed Fenland records. Our boundary is, we hope, defensible but many records as submitted by botanists to the BSBI DDb require further careful localisation to be sure of the point to which they refer. In numerous cases, we have to admit the record as "Fenland edge", meaning it could be part of our study area, but equally might not *e.g.* records with a general grid reference and locations such as "Coningsby", "Dersingham" and "Waterbeach". Records where we've made that kind of judgement are annotated. The output consisted of 14 workbooks, two for each vice county, with records that could be located to a tetrad (or better) in one file and those where the hectad is the most precise scale to which we can allocate the data in the other. These are now being incorporated in FFDb, ready for the next stage.

The *Fenland Flora* is clearly the first attempt to write a floristic account focussing on this region and, as such, should be a baseline for any future studies. However, we are very interested to compare the situation in 2000-2020 with that in previous decades and centuries. These historical data are bound to have a less comprehensive coverage, especially if divided into time-periods such as 1970-1999 and pre-1970, but will be the basis for an analysis of floristic change in Fenland.

The plan for 2020-2022

The following timetable and outline of flora contents is extremely simplified but at least gives an indication of how we expect production of the flora to proceed.

1) Standardise taxonomy in database and perform final QA check – June 2020
2) Pass database to Mark Hill for analysis – July 2020 (iterative with Jon and Owen)
3) Produce brochure with annotated contents of flora and sample species accounts. Get sample quotes on costings from designers/publishers - July 2020
4) Contact stakeholders and potential sponsoring organisations with an overall budget for production of the flora and request for funding (looking to contributions from a range of bodies) - August 2020
5) Drafting of the contextual chapters – begin August 2020 (completion by winter 2021/22).
   These will focus on:
   - Recording of the flora
   - Habitats and landscape (*e.g.* Fenland islands and coast, inland peat, marshland, the Fenland edge *etc*). Following habitat categories are proposed (not in order of importance):

True Fen (NNRs etc); Saltmarsh; Rivers; Drainage channels (field and roadside ditches, IDB drains, arterial rains); Pits and reservoirs; Floodbanks (inland and coastal); Washland; Old grassland; Hedges (old vs amenity plantings, shelter-belts); Churchyards (including walls); Urban (lawns, waste ground, docks, walls); Roads (main and minor, discussion of older routes, impact of de-icing salt etc); 19th Century engineering (bridges and railways); Broken tarmac and gravel gateways; Arable

- Geology and soils
- Palaeoecology
- Drainage and its history
- Social History
- Agricultural history
- Urbanisation and transport, including waterways
- Habitat conservation and restoration

6. Production of species maps and individual species accounts – begin September 2020 (completion spring 2022)
7. Completion of draft flora – summer 2022
8. Publication – 2022/23

Published outputs from the Fenland Flora in 2019:

Mountford, J.O. and Graham, J.J.. 2019a. Flora of the Lincolnshire Fens. *Conservation Management* **19:** 5-8

Mountford, J.O. and Graham, J.J. 2019b. It's the pits – a Fenland Flora retrospective on plant hunting around Whittlesey. *Nature in Cambridgeshire,* **61,** 11-22

Mountford, J.O. and Sparks, T.H. 2019. *Changes in the Vegetation of Wicken Fen NNR between 2010-12 and 2017-18.* Final report to the National Trust.

From the end of June 2020, the FFDb will be closed to new records except in a very few exceptional cases *i.e.* if you observe nationally/regionally rare or scarce species or Fenland specialities, please do contact us (see below). We too expect to leaven the process of writing with odd trips looking for such species. We will continue to post annual news about the progress of Flora production.

At the close of Phase 1 of the project, we wish you happy botanising in 2020 and beyond, and record our thanks to you all for records, access, information and encouragement over the past 15 years.

Jon and Owen, 6th June 2020

Anyone interested in learning more about the Fenland Flora should contact:

Owen Mountford at om@ceh.ac.uk or fenburdock@icloud.com and 193 Great North Road, Eaton Socon, St Neots, Cambridgeshire, PE19 8EE *or*

Jonathan Graham at jonathan.graham@ntlworld.com

***Fenland Flora* coverage on 20th May 2020**
Numbers of species recorded since 2000