Progress with the Fenland Flora in 2018

Owen Mountford and Jonathan Graham

The end of the beginning – botanising and data gathering in 2018

Although the concept of the *Fenland Flora* goes back nearly 50 years, we have only been actively surveying since 2005. The pace and intensity of recording has increased with each year and we have been able to see our coverage map turn from blank to red to green. In our last report, we stated that 2018 would be our last full field season and that data collation and analysis would begin in 2019. To a great extent, we've been able to meet that schedule but, probably not surprisingly, some of the milestones we'd hoped to pass by now remain ahead of us. Wise counsel from others who've written floras warned us that the task is always bigger than one thinks! However, by the end of 2018 we were very close to completing the tetrad survey and have also started on the targeted search for rare species with few or no recent records. We plan to continue with under-recorded tetrads until the end of June 2019 and to provide some relief from analysis and writing by occasional forays through the year looking for the special plants of Fenland. Other than for these rarities, we will close the database at the end of spring 2019 and begin the process of analysis and map production. Thus, the first half of 2019 may not be the beginning of the end, but it should be the end of the beginning.

Over the winter of 2018-19, the last of the major county datasets, West Norfolk (vc 28), was passed to us by Richard Carter – around 200 tetrads and with information going back to the start of the 19th century. To aid this transfer and make our job easier, Richard spent a lot of time filtering out non-Fenland records from the tetrads on the edge of our study area. Together with the Norfolk Flora Group, he had introduced a strategy of distinguishing records above and below 5m AOD when surveying these Fenland-edge sites – once again making our collation of the data much more straightforward. We are hugely grateful for this body of information. There are now no major gaps in the recent (post-2000) coverage of Fenland. We have discussed in detail with BSBI the transfer of national data and that will occur this summer.

With each successive year, the inputs from other botanists to this project become more and more significant. We repeat our debt to Robin Stevenson for his focus on what, for us based in Whittlesey and St Neots, is the most remote part of Fenland - the east shore of the Wash north of King's Lynn. Jeremy Fraser married his work on County Wildlife Sites to the needs of the Flora, and provided numerous datasets on drains, roadsides and gravel pits in Lincolnshire. Records for the major nature reserves and habitat creation projects came from Baston and Thurlby Fens (Kerry Harrison), Woodwalton Fen (Pete Stroh) and the Great Fen (Margaret Palmer and Paul Tinsley-Marshall). Lewis Saunders had already well and truly "put Wisbech on the map" botanically and, though busy elsewhere in 2018, nonetheless managed some interesting records of urban weeds.

The collaboration of the BSBI vice-county recorders has been vital in the progress and success of the project to date, as well as their coordination of local flora groups in South Lincolnshire, Norfolk and Cambridgeshire. The *Fenland Flora* is intended to complement and add to their own local efforts, and we are happy to acknowledge their role in bringing our flora survey so close to completion: David Broughton, Richard Carter, Bob Ellis, Alyson Freeman, Paul Kirby, Sarah Lambert, Alan Leslie, Jo Parmenter, Martin Sanford and Jonathan Shanklin.

From quite early in the *Fenland Flora* project, we have given talks to interested groups on what we were doing and what we were finding. As the project has become better known and the amount of information burgeoned, such talks have become more frequent. Toward the end of 2018, we spoke at three events that were immensely valuable not just in informing a wider audience but in our learning about other data-sources and possible collaboration. In November at Woodhall Spa, we spoke to the *Lincolnshire Wildlife Trust Conservation Forum*, following a talk from Sarah Lambert, both stressing the role of volunteers in plant recording projects. Later that month, we contributed to the "present" portion of the *Cambridge Conservation Forum Autumn Symposium* on "The Fens, Past, Present and Future". One objective of the *Fenland Flora* has always been to provide up-to-date information for those charged with managing the land and water, and thus, in early December we gave a presentation to the meeting of the *Middle Level IDB Biodiversity Action Plan Partnership*.

Fenland history – grassland on earthworks of Wainfleet old town © Owen Mountford (2018)

Fenland botanical highlights from 2018

Here we will follow the pattern of reporting from both 2016 and 2017, and describe the botanical high points of 2018 through the different habitats and regions of Fenland that were surveyed, subdividing the account into seven sections: a) semi-natural fragments and nature reserves; b) grasslands (wash-lands, flood-banks, churchyards and verges); c) hedges and woodlands; d) drainage channels large and small; e) gravel and clay pits; f) arable land and headlands; and g) ruderal habitats and alien species.

Nature Reserves and SSSIs

Nature reserves and other protected areas have received more consistent and detailed attention by expert botanists than the wider countryside, but nonetheless new discoveries are constantly being made – partly due to the very richness of such sites. Probably the most famous Fenland reserve is at Wicken, which was visited by the Cambridgeshire Flora Group (CFG) in 2018, finding the hybrid of Early

and Southern Marsh-orchids (*Dactylorhiza x wintoni*) that Pete Carey had previously noted on several parts of the reserve, as well as *Crataegus x subsphaerica* (a hybrid between the Common Hawthorn and the introduced *C. rhipidophylla*), which has turned up at various places in Fenland. The *National Trust* commissioned Owen to conduct a vegetation survey of the habitats of the old fen in 2017 and 2018. The main purpose of this project was to provide information for site management but it also revealed overlooked populations of both *Lathyrus palustris* and *Thyselium palustre*. This survey also confirmed the survival of the Large-flowered Hemp-nettle (*Galeopsis speciosa*) on balks in the reedbed at Wicken. At one time a fairly frequent arable weed in Fenland, this beautiful Labiate is increasingly found only on nature reserves, as at Baston Fen (Sarah Lambert) and Lakenheath Fen in 2018.

Pete Stroh and Jon made a number of surveys of Woodwalton Fen NNR, happily finding many locally uncommon sedges (*Carex demissa, C. echinata* and *C. pallescens*) and ferns (*Dryopteris borreri* and *D. carthusiana*) still present. Such species have been recorded often over the years by Maurice Massey, Terry Wells and David Broughton but other species were apparently new *e.g. Juncus tenuis* on the main drove (also known at Holme Fen and well-established at Wicken – due to botanists' boots?). They also confirmed the Soft Hornwort (*Ceratophyllum submersum*) in Rothschild's Mere. Maybe the most intriguing record was a possible occurrence of "English Dandelion" (*Taraxacum anglicum*) which had previously only been found in Huntingdonshire at Port Holme and nearby grasslands a century ago by E.W. Hunnybun. Botanising continued well into the autumn when a mainly bryological excursion on Holme Fen NNR with the two Jonathans (Graham and Shanklin) found many sporlings of *Osmunda regalis* on a recently disturbed wet area of deep peat by a hollow renowned for its bog-mosses (*Sphagnum* species) – an optimistic note for this extremely rare species in Fenland.

Clump of Sweet Gale (*Myrica gale*) at Woodwalton Fen NNR © Pete Stroh (2018)

Richard Taylor of the RSPB's reserve at Ouse Fen between Over and Bluntisham invited us to conduct surveys of the terrestrial and aquatic habitats, taking us by 4WD and boat to the various parts of this habitat creation project. Although there was some less positive observations (the abundance of *Crassula helmsii* was truly daunting), the new wetlands had nice stands of both *Juncus compressus* and *Oenanthe aquatica*, as well as what is certainly the largest population of Nodding Bur-marigold (*Bidens*

cernua) in Cambridgeshire and probably in the whole Fenland. Jonathan Shanklin also found a few plants of *B. cernua* by the adjacent river Great Ouse and one might surmise that it had spread from such poached riverbanks and pool shores onto the drawdown zones of these new lakes. During 2013 and 2014, Jon (working with the entomologist Martin Hammond) had made detailed surveys of the Ouse Washes, both the nature reserves and farmed areas. We returned to the Salters Lode end of the washes in August finding, amongst others, Sweet Flag (*Acorus*) by the Well Creek, several stands of Golden Dock (*Rumex maritimus*) on dredgings and drawdown habitats and yet more Hemlock Water-dropwort (*Oenanthe crocata*). "Atlas 2000" suggests this *O. crocata* is almost absent in eastern England between the Thames and the Humber, and indeed in East Yorkshire too, but it is turning up here and there in Fenland (*e.g.* by the Witham, on the Nene Washes), and is especially frequent near the lower parts of the Great Ouse.

Verrall's Fen, Wicken Fen NNR – horse-grazed semi-natural fen © Owen Mountford (2018)

Grasslands in Fenland

Both a look out of the car window as one journeys through Fenland and any examination of the land-cover maps confirms that semi-natural and species-rich grasslands are very uncommon. The most extensive grasslands are those of the washlands, especially of the Nene and the Great Ouse, but here and there smaller old pastures and meadows survive, often associated with historical sites such as the old town of Wainfleet (portrayed above). Even these relict areas have frequently been treated with broad-leaved herbicides, meaning that the only old grassland species to survive are graminoids like *Trisetum flavescens, Luzula campestris* and *Anthoxanthum odoratum*. The commons around Soham are exceptional in this regard and we have often had cause to mention their botanical riches, as both

CFG and we have made detailed surveys *e.g.* finding Meadow Saxifrage (*Saxifraga granulata*) at Moor Closes and outlying sites for the Green-winged Orchid (*Anacamptis morio*) in 2018. A less well-known area of old grassland is the Abbey Fields at Thorney which we visited with Rex Sly in May, where the grasses of old pasture were accompanied by much *Galium verum, Ranunculus bulbosus* and, best of all, patches of Adder's-tongue Fern (*Ophioglossum vulgatum*).

Old pasture at Abbey Fields, Thorney with *Ophioglossum vulgatum* – note also the Mistletoe (Viscum album) on old trees around the grassland © Owen Mountford (2018)

Similar comments can be made about the old grassland that are associated with both sea-banks and the floodbanks of rivers and drains. Here also, too often herbicides or neglect have produced a coarse or herb-poor sward, but numerous exceptions do exist. Rough Hawk-bit (*Leontodon hispidus*) often marks out the least improved and south-facing grass banks, as on the ancient sea-banks at Fosdyke and Wigtoft. The banks have often been constructed with base-rich clays or other limey materials, but locally more acid conditions exist (such as near Wainfleet) and can support patches of Bracken (*Pteridium aquilinum*), often with colourful patches of Rosebay (*Chamerion*). Exotic bank material can bring other plants into Fenland where otherwise they are almost absent *e.g.* Jonathan Shanklin's records of Sheep's Fescue (*Festuca ovina*) on the South Bank of the Nene Washes and by the Mepal Outdoor Centre. Tor-grass (*Brachypodium pinnatum* sens. lat.) is now quite widespread on older banks of drains in the centre of Fenland. Among the starkest examples of bank-material affecting the vegetation are the grasslands of the Cutoff Channel in Suffolk and Norfolk, where the drain has been cut through to the chalk bedrock and then piled up as embankments on both sides of the watercourse. The Norfolk Flora Group (NFG) and we have made numerous surveys of this feature between Denver and Mildenhall, and most lengths have interesting grasslands with plants like Pyramidal Orchid. The

use of chalk for the embankments of irrigation reservoirs nearby but within the Fenland proper provides opportunities for calcicolous grassland plants like Hairy Rock-cress (*Arabis hirsuta*). Rougher clay banks on the edge of the peat fens can also produce surprises such as Giant Horsetail (*Equisetum telmateia*) on the Fenland edge near Ramsey Forty Foot.

Relict old-grassland species on a ditch bank protected from herbicide and fertilisers: Cowslip (*Primula veris*) near Kirton End © Owen Mountford (2018)

One outstanding grassland site recorded in 2018 comprised the verges of Hospital Drove near Sutton Bridge, which for part of its length is a green lane with unimproved swards marked once again by *Anthoxanthum, Luzula campestris* and *Leontodon hispidus* but also by sheets of Quaking Grass (*Briza media*). As our tetrad-surveys are generally constrained to public rights-of-way, we have become very familiar with the typical road-verge, where less improved and more frequently mown portions stand out from the morass of couch, false-oat, cock's-foot and keck, often due to *Galium verum*, Wild Carrot (*Daucus carota*), Blue Fleabane (*Erigeron acris*) and a range of vetches. As we noted in 2017, among the best grass verges are those of the newly-established Fenland highways (A16, A17, A47, A141 and A151). Wherever a length of these roads is within a tetrad, the species-richness rises and we again saw new sites for Greater Burnet-saxifrage (*Pimpinella major*) and Wild Marjoram (*Origanum vulgare*) between King's Lynn and Sleaford. The impact of de-icing salt on road verges is everywhere apparent but some of the halophytic species are now spreading more widely away from main roads, such that Reflexed Saltmarsh-grass (*Puccinellia distans*) is turning up on droves as much as 4km from the public road as well as in wet gateways; patches of Sea Couch (*Elytrigia atherica*) have been found on waste ground, ditch and drain banks, in addition to main roads, as far inland as Stretham.

Some grasslands do not quite fit into the simple categories already described. We made special mention in our progress report for 2017 of the discovery by Jeremy Fraser and Caroline Steel of Common Cotton-grass (*Eriophorum angustifolium*) in more acid wet grassland near the Nocton Delph. We returned to this site with Caroline and Jeremy in 2018, finding two patches of the cotton-grass, each of 60-70 plants, and also calcifuge mosses such as *Polytrichum commune,* and the odd spike of Southern Marsh-orchid (*Dactylorhiza praetermissa*).

Jeremy Fraser, Jon Graham and Caroline Steel confirming the extent of the *Eriophorum angustifolium* patch by Nocton Delph © Owen Mountford (2018)

Finally, special mention should be made of the eastern fringe of Fenland, where it abuts Breckland and the sands around and north of King's Lynn. It can be exceedingly difficult to make an objective definition of what is and what is not Fenland in this region, as the situation on the ground is a gradual transition from one landscape and soil to the other. With our fingers crossed and some misgivings, we included a lovely road verge north of Beck Row as Fenland, with its big population of Sand Catchfly (*Silene conica*) as well as *Medicago sativa* subsp. *falcata* and *Phleum arenarium.* Similarly, the soils of the coastal strip between Hunstanton and Lynn with shingle and sand flats by the silt levels produced, amongst other goodies, both Mossy Stonecrop (*Crassula tillaea*) and Wild Clary (*Salvia verbenaca*), neither of which is exactly a typical Fenland plant!

Hedges and woodlands

Most of the habitats dominated by woody plants in Fenland are planted – hedges, shelter-belts, orchards and plantations. Although most woodlands in Fenland were planted over the past century, very locally they are of older origin and support some ancient woodland indicators, such as Dog's Mercury and Wood Speedwell (*Veronica montana*). For example, near the Kymes in Lincolnshire, there are fragments such as Ferry Wood and Old Wood with a scattering of old woodland species. In 2018, we found Small Teasel (*Dipsacus pilosus*) in this area, a species which is otherwise mainly found at the Fenland edge *e.g.* by the Holme Brook. Other small woodlands and shrubberies may be dominated by willows and can be derived from planted holts or develop through succession. *Salix* is a complex genus in Fenland with many hybrids frequent, sometimes introduced specifically as osiers whilst others have probably occurred naturally: *S. x calodendron, S. x holosericea, S. x reichardtii* and *S. x smithiana*. *S. x fruticosa* is the hybrid between Osier (*S. viminalis*) and Eared Sallow (*S. aurita*) and, despite the absence of the latter parent over much of Fenland, this shrub now turns up on ditch banks and carr, possibly due to its use in biomass production. Older willows are an important habitat for epiphytes, both Bryophyta and vascular plants – for instance, Alan Leslie found both *Polypodium vulgare* and *P. interjectum* on Crack Willow by the Commissioners' Pit near Upware.

Ferry Lane between North & South Kyme – old grass verges and hedges with Dog's Mercury (*Mercurialis perennis*) © Owen Mountford (2018)

Most hedges are clearly the product of more recent plantings with mixes of both native and exotic species, or increasingly with non-native relatives of familiar British species *e.g. Cornus sanguinea* subsp. *australis* and *Viburnum trilobum*. Recognition of the presence of these introduced "lookalikes"

in hedges and plantations owes a great deal to the work of Peter Sell and Gina Murrell, as published in their 5-volume *Flora of Great Britain and Ireland* (*FOGBI*). From these books, we realised that, for example, many of the planted birches in Fenland were not actually *Betula pendula*, but included species such as *B. celtiberica* and *B. populifolia*. Incidentally, *FOGBI* also demonstrates that there are many more elms (*Ulmus* species) in our region than the few listed in other floras, as well as a greater variety of *Chenopodium* and *Polygonum* species. The variation in Wood Goldilocks (*Ranunculus auricomus* group) revealed by Alan Leslie in *FOGBI* may well add to the species-list for Fenland, where Goldilocks turns up in shaded churchyards such as at Chatteris. Alan has also shown that some scrubby places in Fenland hold a much greater range of brambles (*Rubus* species) than does the open farmland, for example finding four different species in the Gildenburgh and Lattersey part of Whittlesey. In conclusion, wooded, scrub and hedge habitats in Fenland are often a blend of the native and the exotic, sometimes with very unexpected species such as *Populus simonii* in the A16 shrubbery near Spalding and the Medlar (*Mespilus germanica*) and *Euonymus sieboldianus* along the old railway south of Chatteris found by Jonathan Shanklin and CFG on a wet October day.

Crataegus crus-galli var. inermis **on a rural roadside in Holbeach Fen © Owen Mountford (2018)**

Drainage channels, rivers, pools and lakes

Our survey of Fenland continues to show how important the drainage network, both natural and artificial, is as a refuge for aquatic and water-margin species. Through much of the region, except the silt Marshland nearer the Wash, several nationally uncommon aquatic macrophytes are rather frequent and in 2018 we found numerous new sites for Whorled Water-milfoil (*Myriophyllum*

verticillatum), Flat-stalked Pondweed (*Potamogeton friesii*), Hair-like Pondweed (*P. trichoides*) and, at the edge of main drains and rivers, Frog-bit (*Hydrocharis morsus-ranae*). Much less widespread, but locally common is the Opposite-leaved Pondweed (*Groenlandia densa*) where we again found new sites in the area north of Peterborough, such as near Newborough. Possibly the most heartening aspect of the survey of drainage channels is the discovery of plants that require low nutrient levels – species that have generally declined due to sewage and fertiliser runoff into ditches. Thus, Needle Spike-rush (*Eleocharis acicularis*) was found at sites at Wimblington Common, in a soak dyke by the Witham near Kirkstead Abbey and Dunston Bankside Drain. During summer 2018 Jon made a detailed study of ditches and associated habitats in the arable fen between Somersham, Chatteris and Ramsey, finding good populations of Lesser Water-plantain (*Baldellia ranunculoides*), Floating Club-rush (*Eleogiton fluitans*) and numerous pondweeds, including Various-leaved Pondweed (*Potamogeton gramineus*). The Soft Hornwort (*Ceratophyllum submersum*) is only rarely a channel species, as in the brackish ditches between King's Lynn and Hunstanton. Almost all our records are for pools and, in 2018, as well as the mere at Woodwalton Fen, we found a new site in pond within a woodland fragment near Holbeach St Mark's.

Various-leaved Pondweed (*Potamogeton gramineus*) on Pidley Fen © Jonathan Graham (2018)

There is considerable concern about the spread of three invasive aquatic species both in Fenland and generally in lowland Britain: New Zealand Pigmyweed (*Crassula helmsii*), Floating Pennywort (*Hydrocotyle ranunculoides*) and Parrot's-feather (*Myriophyllum aquaticum*). During 2018, we found huge populations of *C. helmsii* especially in gravel pits near Over, Market Deeping and Bourne, but also in seasonally flooded ground near Bluntisham, Adventurers' Fen (Wicken) and on the Nene Washes as well as, more ominously, in the drainage network near Swavesey and Newborough Fen. *H. ranunculoides* was found further down the Great Ouse from the 2017 Southery sites at Hillgay Bridge by Kevin Walker and Clare Pinches as well as by the River Witham and in the Kyme Eau. As yet, *M.*

aquaticum is very uncommon in Fenland, but Owen found it well established in the Joist Fen part of the Lakenheath Fen RSPB reserve during the BioBlitz there in July 2018.

Although most watercourse banks are sadly overgrown, some true fen species survive in such places provided the vegetation is not too coarse. Common Meadow-rue (*Thalictrum flavum*) is especially widespread with many new records, for example in Bourne North Fen, near Holbeach and Shippea Hill. More surprising was a small population of Parsley Water-dropwort (*Oenanthe lachenalii*) by a ditch next to the A17 near Long Sutton. When Owen found this in late summer 2018, he thoroughly expected it to be a new record but, on consulting the BSBI database, there was precisely the same location recorded by Brian Hedley in 1999! Where the channel bank habitat is broader, forming a wet berm, fen species can form quite large stands as, for instance, Tufted Sedge (*Carex elata*) by the Engine Drain near Southery and between Nocton Delph and its soak dykes. Many ditches in arable land are summer-dry but where they are cleaned regularly, invasion by weeds and reed is held at bay and lower-growing aquatics like Horned Pondweed (*Zannichellia palustris*) survive. One such ditch near Moulton Seas End produced a patch of the alien Slender Rush (*Juncus tenuis*), a most unexpected record, atypical of its usual habitats and new to that hectad. An equally surprising record, though for a native species, was the discovery by Jonathan Shanklin and CFG of Common Yellow-sedge (*Carex demissa*) on the banks of a runoff pit on the edge of Stretham [found there in 2017 by ACL].

Drainage channel banks can also be important for dry grassland plants and for species of open ground, especially where mowing suppresses bramble and tall grasses. Field Pepperwort (*Lepidium campestre*) is local though widespread in such sites in Fenland, with good stands recorded in 2018 near Stainfield (close to Bardney) and along the Sixteen Foot Drain near Wimblington. At the latter site, Jonathan Shanklin found Keeled-fruited Cornsalad (*Valerianella carinata*), an annual with very few Fenland sites.

Hybrid Cinquefoil (*Potentilla x mixta*) on Wimblington Common © Jonathan Graham (2018)

Gravel and clay pits

One particular group of habitats deserve special mention, as they do not fit readily into the working categories we have generally used and because they support some of the richest and most diverse native vegetation of any sites in Fenland. Abandoned sand and gravel pits are very much a feature of the west edge of Fenland between Peterborough and Bourne, but also occur near Mepal and Wimblington and in the lower Nar valley near Blackborough. Pits created by the brick-clay industry surround Whittlesey and smaller borrow pits dot the Fenland landscape where material was needed to construct railway and road embankments or where flood-banks line the main rivers and arterial drains. Some of these sites were seminal in generating the idea of a *Fenland Flora*, and others have become important nature reserves and SSSIs such as the Deeping Lakes, Bassenhally Pit and Upware North Pit. In 2018, we returned to some of these sites which we'd first looked at in the 1960s and also surveyed others that are now in the process of abandonment.

In the 20th century, the value of Wimblington Common for wild plants was first demonstrated by Graden Smith, a botanist resident in March (now Chatteris) and Peter Langton, a teacher at the Neale-Wade school. Later surveys by the CFG have confirmed that much of interest remains but the hybrid swarm of marsh and spotted orchids that occurred in willow woodland here in the early 1970s appears, from our 2018 surveys, to have gone. Open sand and gravel flats survive and dry grassland, with Hybrid Cinquefoil (see illustration) and an interesting mix of mulleins including *Verbascum blattaria* and *V. virgatum*. *Potentilla x mixta* has a few sites on more base-poor grasslands near Sutton in the Isle, but together with one of its putative parents (either *P. anglica* or *P. erecta*) is decidedly rare in Fenland. Moth Mullein (*V. blattaria*) is now also established by old brick-pits at Gildenburgh and King's Dyke, often in a white-flowered form which may be the horticulturalists' "White Blush".

The pits around Whittlesey are especially numerous and one cluster, including Gildenburgh and the Lattersey Local Nature Reserve, was the subject of a CFG meeting in August. Alan Leslie, Chris Preston, Jonathan Shanklin, Mark Hill and the group focussed on those pits whilst Owen had a roving brief to cover the whole tetrad. As well as many native species, such as *Blackstonia* and *Carex pseudocyperus*, that are uncommon in Fenland, the CFG found what may be only the second record in the UK for *Scrophularia grandiflora* and also the distinctive mint hybrid, *Mentha x villosonervata*. Meanwhile, working south of the railway, Owen recorded the (now increasingly widespread) Annual Beard-grass (*Polypogon monspeliensis*) on moist gravel. Sadly, the wet carr and pools that had occupied much of Lattersey Hill in the 1970s is now largely under an industrial estate or fenced off but Owen did find both Bracken and Greater Tussock-sedge (*Carex paniculata*) surviving well in a fragment. Making a long loop back to Lattersey via Wype Doles and Eastrea, he was also able to admire one of the large populations of *Eleogiton* discovered by Nick Millar in 2006.

Jon looked at Deeping Lakes LNR in June making a much more extensive survey than Lewis Saunders and Owen had managed in 2015, when their focus had been land under Higher Level Stewardship. Although much of what he saw was known already, the list was still very impressive with five species of orchid and two hybrids (*Dactylorhiza x grandis* and *D. x kernerorum*), *Briza media,* more *Blackstonia,* Grass Vetchling (*Lathyrus nissolia*) and Small-fruited Yellow-sedge (*Carex oederi*), the latter known well at Baston Fen but otherwise with only two other recent South Lincolnshire sites, one in Fenland and one just off. Another survey of gravel pits took Jon and Owen to an area near Baston with Jeremy Fraser of the Lincolnshire Wildlife Trust. Here the pits were generally more recently abandoned and the habitats consequently more open. In such situations, both Beard-grasses (*P. monspeliensis* and *P. viridis*) were abundant, as again was Grass Vetchling and also the Narrow-leaved Bird's-foot-trefoil (*Lotus tenuis*). However, the most exciting features of these dry legume-rich grasslands were several patches of the Slender Tare (*Vicia parviflora*). This is a new vice-county record, and only the second for Lincolnshire as a whole, with the last sighting being by John Dony near Epworth in 1950. The Dony

New aquatic and grassland habitats – irrigation reservoir or wildfowl pit near RAF Holbeach © Owen Mountford (2018)

Long-established wetland and carr habitats - Wimblington Common © Jonathan Graham (2018)

record is thought to be non-native and our own sighting is 30 km north of the closest known native record and hence may also be an introduction. Our walk also took in flooded pits with striking carpets of Pond Water-crowfoot (*Ranunculus peltatus*) in a form without floating leaves and parts of the Gravel Drain, which eventually feeds into the renowned Counter Drain. Here we certainly identified the uncommon stonewort *Tolypella glomerata,* and may also have found *T. prolifera* (to be confirmed) which would make this a very important ditch.

Scented Mayweed (*Matricaria chamomilla*) dominating a fallow field between March and Chatteris © Bill Meek (2018)

Arable land

Although there is sometimes a certain predictability to the limited flora of intensively-farmed arable land, interesting records do turn up each year and 2018 was no exception. The Fluellens (both *Kickxia elatine* and *K. spuria*) are commoner toward the edge of Fenland where the soil becomes chalkier but we observe them well out into the peat fen and *K. spuria* formed sheets in a beet field just outside Ramsey. Bur Chervil (*Anthriscus caucalis*) is significantly more abundant as one nears Breckland, but we occasionally find it in arable headlands elsewhere, as at Pidley, Wimblington and on Great Hale Fen in 2018. A similar pattern is observed in Lesser Chickweed (*Stellaria pallida*), although in that species of light soils in eastern England, there is a strong possibility that it has been overlooked by many recorders until recently. Records for *S. pallida* in 2018 include sites at Swavesey and at Elm, near Wisbech; it remains local but now widespread. We have already remarked on the precipitous decline of *Galeopsis speciosa* as an arable weed but did see at least one such site in 2018 right on the Fenland edge near Bardney. Although Scentless and Scented Mayweeds are common, indeed

abundant (see the photograph above), *Anthemis* species are very rarely recorded and it was thus an event to see Stinking Chamomile (*A. cotula*) in a maize crop on Ewerby Waithe Common. Neophyte species such as Cockspur (*Echinochloa crus-galli*), Indehiscent Amaranth (*Amaranthus bouchonii*) and, in Lincolnshire, White Rocket (*Diplotaxis erucoides*) must now be thought of as regular arable weeds but others, such as Awned Canary-grass (*Phalaris paradoxa*), are still very uncommon – in 2018 we recorded it on rich soils near the Mildenhall pumping station. Rye Brome (*Bromus secalinus*) seems to be making something of a recovery, with new sites at Wainfleet St Mary and North Kyme (Bill Meek). Similarly, the number of records of Green Nightshade (*Solanum physalifolium*) is increasing steadily with 2018 sites near Chatteris, Blackborough End and Quadring. Amongst the rarer non-native weeds of arable headlands are Witch-grass (*Panicum capillare*) at Chatteris and Niger (*Guizotia abyssinica*) which turned up near Warboys (and also by the A17 near Gedney). As agricultural crops change to meet altered climate and new needs, the volunteers and relicts left behind also change. Chinese Silver-grass (*Miscanthus sinensis*) has been grown for biomass production for some decades but evidence of it as a wild plant is only now emerging in Fenland, especially in the transition from Breckland west of Wangford, where it was first found in 2017 and where at least two new sites were noted in 2018.

Ruderal habitats and alien species

Ruderal and urban habitats can provide a refuge for native species and archaeophytes: in mown grasslands, the shaded parts of churchyards, old stone- and brickwork and the open sand, gravel, cinder and ballast of gardens, waste ground, railways and industrial sites. Wall ferns are especially associated with churches, but older brick bridges over main drains in Lincolnshire are another important habitat for *Asplenium* species. The most interesting wall-fern recorded this year was a species normally found in humid woodland, the Soft Shield-fern (*Polystichum setiferum*), which was found on a moist buttress of Wainfleet St Mary's church – only the second post-2000 Fenland record. Stony or sandy habitats by houses and industrial sites can have surprising native plants turn up, such as the Sea Pearlwort (*Sagina maritima*) on winter-wet gravel in a business park near Witchford and the Jersey Cudweed (*Gnaphalium luteoalbum*) by a driveway in Stretham (both records by Alan Leslie). Musk Stork's-bill (*Erodium moschatum*) was once almost confined to the south coast but has spread inland in recent years in open closely mown grass verges. It is now occasional throughout Fenland with large populations found in 2018 on the outskirts of King's Lynn and Spalding (it has been known at the last site for a decade). The spread of the Common Ramping-fumitory (*Fumaria muralis* subsp. *boraei*) continues, with a new site east of Spalding (the fourth vice-county record for South Lincolnshire – all but one in Fenland). Although still most common in short open turf on floodbanks, Corn Parsley (*Petroselinum segetum)* is also found on disturbed roadsides and, as such, is well scattered in the area east of Wisbech, with 2018 sites at Tilney Fen End and Walpole St Peter.

We alluded last year to the rail network as a further important habitat for native flora. As we remarked then, the modern poor management of rail banks has resulted in an impoverished vegetation compared to the period 1950-1980. However, certain sites retain their interest, especially old sidings and ballast or spoil dumps. The wonderful site east of Whittlesey Station has now been all but obliterated but the former marshalling yard at Whitemoor (March) and the dump by the East Coast Main Line at Conington are still remarkable. Sarah Lambert has continued her study of both these sites and in 2018, she found the following notable native species at Conington: Wild Liquorice (*Astragalus glycyphyllos*), *Carex muricata* subsp. *pairae*, Wall Bedstraw (*Galium parisiense*), Bird's-foot (*Ornithopus perpusillus*), Hoary Mullein (*Verbascum pulverulentum*) and Mat-grass Fescue (*Vulpia unilateralis*) among many, many others. White Mullein (*Verbascum lychnitis*) is also found at Conington and extends along the railway toward Holme.

Red Valerian (*Centranthus ruber*) well established on an old railway bridge by the Hobhole Drain at Midville © Owen Mountford (2018)

Occasionally Fenland droves have unexpected native species or archaeophytes well away from their usual habitats. Thus Marjoram (*Origanum vulgare*) grew in Fodder Fen, Prickwillow, though possibly of garden origin from a derelict bungalow there. Catmint (*Nepeta cataria*) is an archaeophyte of the chalk but is scattered along drove-sides and spoil heaps in the black fen of Queen's Ground and near the River Lark. Henbane (*Hyoscyamus niger*) is another archaeophyte of the chalk that also occurs in sandy places. It is decidedly uncommon in Fenland but was found in 2018 by the CFG at Walpole Marsh.

Many of the species of ruderal habitats and urban situations are aliens *i.e.* neophytes and garden escapes. Although some of these species are transient in the wild, others become established for many years. The huge dense stand of Giant Hogweed (*Heracleum mantegazzianum*) that Owen recorded on a sea-bank near Ongar Hill has been known there since the fieldwork for Atlas 2000. When Pete Stroh and Owen found the California Brome (*Ceratochloa carinata*) in three tetrads west from Feltwell in June, this confirmed records made by R. Tofts and Gillian Beckett between 1989 and 1994, though it does seem to have expanded considerably since then. The *Fenland Flora* fieldwork made the first and second South Lincolnshire record for *C. carinata* at Long Sutton (2015) and Swineshead (2017). We found a third site at Saracen's Head in 2018, growing by the old route of the A17 main road. Our annual progress reports have traced the spread of the South African Narrow-leaved Ragwort (*Senecio inaequidens*) in Fenland and this trend continued in 2018 with new sites in gravelly gateways in South Lincolnshire, away from habitation. An equally remote and fascinating

record for Few-flowered Garlic (*Allium paradoxum*) was also right out in farmland by a ditchbank near the Middle Level Main Drain in Wiggenhall St Mary Magdalen parish.

Garden escapes may become established weeds in time. Fenland has very few records for any hawkweeds (*Hieracium* species) but the rather ornamental Dappled Hawkweed (*H. scotostictum*) was found on verges near houses in Gedney in 2018, following on from Lewis Saunders first vc 53 record in a garden centre at Spalding in 2014. The decorative Blue Eryngo (*Eryngium planum*) has a number of grass verge records in Fenland, mainly in Cambridgeshire (Ely, Soham, Witcham *etc*). In 2018, a further site was added by Alex Scott at Sutton and by Owen near the power station in Spalding. A purple form of the Garden Orache (*Atriplex hortensis*), possibly the form "Crimson Plume", has escaped onto a roadside near Ten Mile Bank and has now survived for at least 5 years. Another distinctive *Chenopodiacean*, the Tree Spinach (*Chenopodium giganteum*) was an escape that Jonathan Shanklin confirmed from a CFG trip at Chatteris in October. Plants with its distinctive leaf shape with purple bases are seen in the gateways of some beet and potato fields in Fenland; this escape may prove to be commoner than presently believed (it has just seven confirmed sites in the counties that overlap Fenland, with just the Chatteris site actually in Fenland).

Derelict farm near Brothertoft – such semi-ruins are frequent in Fenland and a source of plants that establish in the agricultural landscape © Owen Mountford (2018)

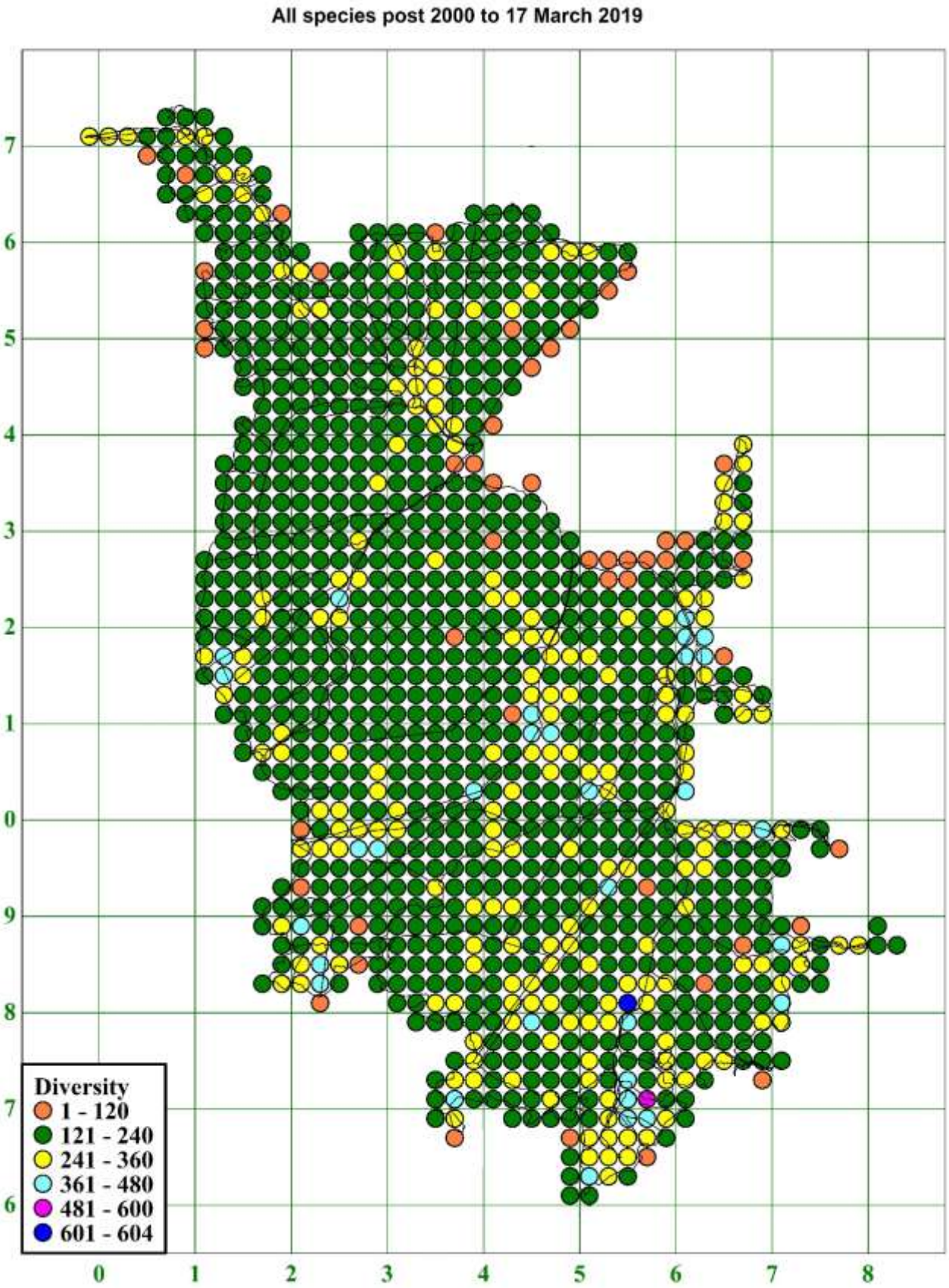
Bryophytes

Over the winter of 2018/19, Chris Preston and JJG have made a number of visits to remote areas of Fenland recording mosses and liverworts to help us prepare a bryophyte checklist for the flora. Following the recent publication of a Cambridgeshire bryophyte flora, much of the focus has been on the Lincolnshire fens where we have been working closely with the county bryophyte recorder, Stephen Heathcote, to target our surveys. Lincolnshire still has some tetrads with no bryophyte records at all, and we have therefore been working hard to change this! In addition to surveys of remote arable areas with the aim of improving general coverage of common species, there have been a number of interesting records from other habitats. A trip to an old duck decoy (Kirton Meeres area, just west of Kirton) revealed several bryophytes that are uncommon in Fenland including *Eurhynchium striatum, Cryphaea heteromalla* and the liverworts *Radula complanata and Frullania dilatata*, associated with the humid wet woodland developing around the decoy lakes. *Pylaisia polyantha*, a rare epiphyte, was found new to South Lincolnshire (vc 53) on the trunk of a mature sycamore beside a large drain near Boston.

Perhaps the most remarkable finds resulted from an October trip to Holme Fen by the Cambridgeshire bryophyte group. The group revisited a small wet hollow known historically for its *Sphagnum* and which has areas of recently disturbed peat. They found 4 species of *Sphagnum* including *S. subnitens* (not seen since the late 1950s) along with uncommon liverworts on the bare peat including *Cephalozia bicuspidata, Calypogeia fissa, Cephaloziella divaricata* and *Riccardia latifrons.* None of the six *Sphagnum* species recorded from Wicken Fen (2003) could be refound in 2008 (Preston & Hill, 2019), and it may be that this site at Holme Fen is the only extant *Sphagnum* site in Fenland.

***Sphagnum subnitens* with *Osmunda* sporling, Holme Fen © Jonathan Graham (2018)**

Fenland Flora coverage on 17th March 2019
Numbers of species recorded since 2000



What now for 2019? Our goals and activities for volunteers.

- With the exception of some coastal tetrads, and those at the landward edge (where only a fragment of Fenland is present), we believe that it should be possible to find at least 120 species even in the most uniform arable fenland with few wet ditches and no villages. There remain a small number of tetrads that should have reached this minimum total but have not – some renewed activity will be focussed there in the first half of 2019.
- In 2019 we will also focus on sites of classic Fenland specialities and rarities, especially where the plants have not been observed recently, and this targeted surveying will continue throughout the year as a break from analysis and writing.

Despite being close to the end of active surveying, we will still accept new data up until the end of June 2019 but we ask botanists to try and get any backlog of relevant data sooner than that if possible.

Anyone interested in contributing to the Fenland Flora should contact:

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Jonathan Graham at jonathan.graham@ntlworld.com
Our web-page is on the BSBI website: http://www.bsbi.org.uk/fenland.html

To help recorders, we will provide on request:

- Standard BRC record cards and those specific to each of the Fenland counties
- Documents defining Fenland – especially important at the edge of our recording area
- Prospectus for recorders, outlining the project objective and how they can help
- The finalised listing of priority tetrads for survey
- Location details for Fenland rarities whose continued presence needs to be confirmed.
- Back-up with difficult identifications

For maybe the last time within the project, we wish you happy botanising in 2019, with many thanks for your efforts so far and look forward to your future contributions toward putting the flowers of Fenland on the map.

Jon and Owen, 19th March 2019

A golden highway in Fenland – Lesser Celandine (*Ficaria verna*) lining the Conington Brook © Owen Mountford (2018)