Progress with the Fenland Flora in 2021

Owen Mountford and Jonathan Graham

The Fenland Flora exists (or at least 40% does!)

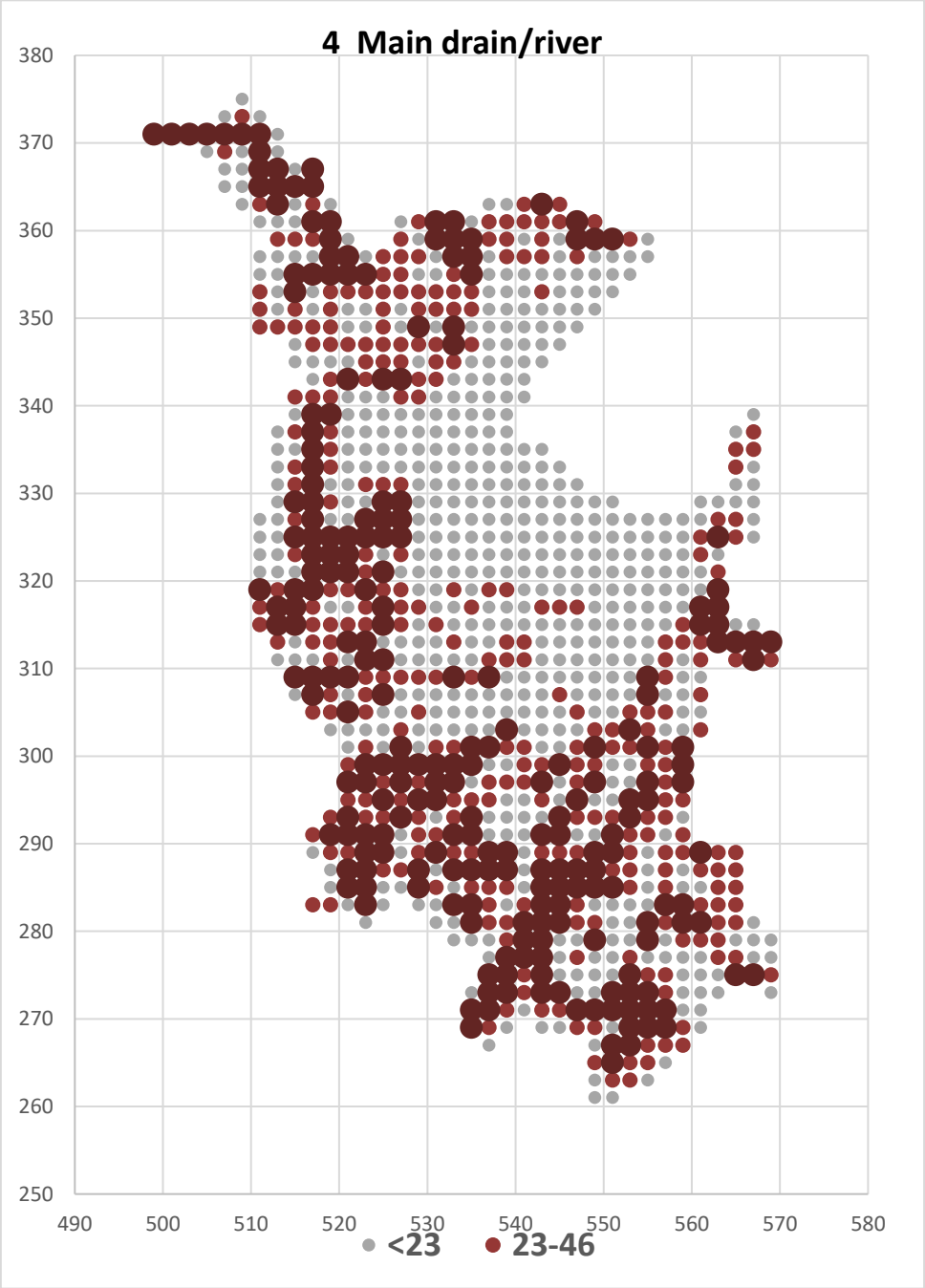
It has been commonplace, even predictable, to say that 2021 was a peculiar year and, for most of us dealing with the impact of Covid-19, it was indeed unusual. Yet, for the particular tasks involved in bringing the *Fenland Flora* to completion, it was a very productive year. For much of the last 17 years, the flora has been a project, and as such could seem rather intangible, even if the surveys, trawling through archives and gradually accruing data were very substantial. In this last year, however, the flora as a real product has become a reality. Jon has been preparing map after map showing the distribution of individual species, doing targeted surveys of drains and under-recorded areas, as well as preparing illustrated accounts of critical groups, such as the water-crowfoots (*Ranunculus* subgenus *Batrachium*) and glassworts (*Salicornia*). Owen has been plodding steadily through the flora, writing individual species accounts, getting as far as the *Amaranthaceae* and, with Jon, preparing sample accounts of a wide range of other species to 'scope' the flora. The database was closed at the end of 2020, though we keep a running file of important new records as they are made and the most important will find their way into the published flora. Mark Hill applied his innovative analytical method SPHERIKM, demonstrated nationally by Preston *et al.* (2013[1]), to produce twenty clusters, each composed of species with similar distributions and ecology in Fenland. An example map for the distribution of the main drain/river cluster (below) includes species such as *Nuphar lutea, Elodea nuttallii* and *Sagittaria sagittifolia*.

We can repeat verbatim a comment from the report for 2019-20 "flora writers had counselled us that each stage always took longer than one would hope". The milestones that we have set may indeed have been deferred but, as this introduction makes clear, substantial progress has been made over 2021. This progress report is much shorter than those from recent years, but we hope will still prove of interest to everyone who is concerned about the biodiversity of Britain and especially the habitats and flora of the Fenland region.

Flooded Nene Washes © Jon Graham (February 2021)

[1] Preston, C.D., Hill, M.O., Harrower, C.A. and Dines, T.D. (2013). Biogeographical patterns in the British and Irish Flora. *New Journal of Botany*, **3(2):** 96-116.

Distribution map for the main drain/river cluster



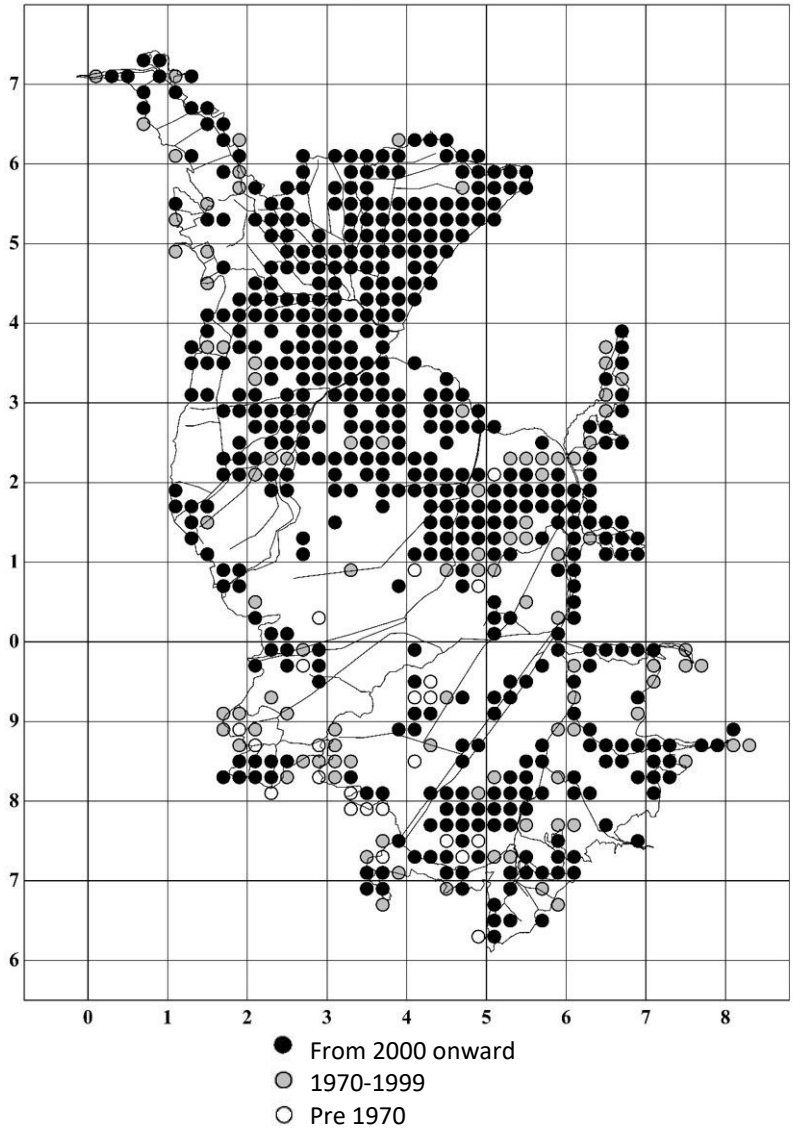
Completed Fenland Flora Accounts

Working in his study on the top floor (10th) of a tower block on Șoseaua Ștefan cel Mare in Bucharest, Owen has produced a steady output of individual species accounts, varying in length from just eighty words for the casual *Malcolmia africana* to 2500 for *Phragmites australis.*

Each full species account comprises an outline of the names, both scientific and vernacular, that have been applied to the plant in Britain and especially in Fenland. There is then an summary of any variation (subspecies, varieties, cultivars) that are described for the species. The species distribution is shown in a tetrad map, with the latest records depicted in three categories: pre-1970,

1970-99 and 2000 onward (see example of *Lathyrus pratensis*). The earliest record in Fenland that we have traced for each species is then listed. Quite often we have to include several records as the earliest observations may use a place-name on the edge of Fenland that may or may not refer to our area of study. We then describe any evidence for each species being native or introduced in Britain and Fenland, looking back to postglacial times if necessary. Most plants have their first Fenland records in the 19th century, though we have data for some plants growing in Fenland as far back as the late 16th century. The account then includes outlines of the distribution in the 19th century, in the first part of the 20th century (to 1970) and in the last thirty years of the century (1970-99).

Lathyrus pratensis old verge/bank cluster



Between 1800 and 2000, it became more practical to distinguish records from the Fenland proper from those that might refer to sites on the surrounding 'upland'. By the 21st century and the intensive recording for the *Fenland Flora,* most records relevant to the project can be easily defined. The key section of each species account is the description of the present distribution and the habitats that it occupies. This discussion includes the results of Mark Hill's analysis, placing each species in its floristic context in Fenland. The species account concludes with some comments on the importance of each species for nature conservation, which is often rather different in Fenland to their status in England or in Britain as a whole.

There are already draft accounts for all the species within the following taxonomic groups (mainly families). We have been working systematically through the flora but a selection of accounts for species from other families have been prepared for demonstration purposes.

I. Pteridophyta – all ferns, clubmosses, horsetails *etc.*

II. Gymnosperms – all coniferous trees

III. Primitive Angiosperms – *Nymphaeaceae, Aristolochiaceae, Magnoliaceae, Lauraceae*

IV. True Dicotyledons

a) All species in the following families

Ceratophyllaceae
Papaveraceae
Berberidaceae
Ranunculaceae
Platanaceae
Buxaceae
Gunneraceae
Paeoniaceae
Grossulariaceae
Saxifragaceae
Haloragaceae
Vitaceae
Fabaceae
Polygalaceae
Rosaceae
Elaeagnaceae
Rhamnaceae
Ulmaceae
Cannabaceae
Moraceae
Urticaceae
Nothofagaceae
Fagaceae
Myricaceae
Juglandaceae
Betulaceae
Cucurbitaceae
Celastraceae
Parnassiaceae
Oxalidaceae
Hypericaceae
Violaceae
Passifloraceae
Salicaceae
Euphorbiaceae
Linaceae
Geraniaceae
Lythraceae
Onagraceae
Myrtaceae
Staphylaceae
Anacardiaceae
Sapindaceae
Rutaceae
Simaroubaceae
Malvaceae
Thymelaeaceae
Cistaceae
Tropaeolaceae
Limnathaceae
Resedaceae
Brassicaceae
Santalaceae
Frankeniaceae
Tamaricaceae
Plumbaginaceae
Polygonaceae
Droseraceae
Caryophyllaceae

b) Selected species from families not as yet comprehensively covered

Acanthus spp.
Cirsium vulgare
Cornus sanguinea
Euphrasia (all species)
Galium aparine
Galium verum
Hippuris vulgaris
Hydrocotyle ranunculoides
Jasminum nudiflorum
Lamium album
Myrrhis odorata
Portulaca oleracea
Sambucus nigra
Senecio inaequidens
Senecio vulgaris
Taraxacum (all species)
Tephroseris palustris
Teucrium scorodonia
Vaccinium oxycoccos
Veronica beccabunga
Veronica persica

V. Monocotyledons

Selected species from families not as yet comprehensively covered

Anthoxanthum odoratum
Carex appropinquata
Carex flacca
Eleocharis acicularis
Elymus repens
Galanthus nivalis
Groenlandia densa
Juncus subnodulosus
Lolium perenne
Phragmites australis
Poa annua
Potamogeton compressus
Sparganium erectum

***Senecio sarracenicus*, bank of field-drain adjoining Woodwalton Fen NNR © Pete Stroh (August 2021)**

Fenland botanical highlights from 2021

Springtime produced a small flurry of dandelion records. The Cambridgeshire Flora Group (CFG) refound *Taraxacum glauciniforme* at King's Dyke Nature Reserve (previously recorded by Jonathan Shanklin in 2020), Jon and Pete Stroh recorded *T. hamatulum* at Soham, Wicken and Woodwalton Fen as well as refinding and counting important populations of marsh dandelions: *T. anglicum* at Woodwalton Fen and *T. palustre* at Soham Wet Horse Fen SSSI. Return summer visits to Woodwalton Fen by Owen, Jon and Pete updated a number of important records (including *Isolepis setacea, Stellaria alsine, Oenanthe lachenalii*, *Ranunculus aquatilis, Viola stagnina, Viola canina)* further highlighting how special this site is. A flowering stand of *Senecio sarracenicus* (spread to a ditch bank just outside of the reserve) was an interesting find but sadly an exhaustive search failed again to refind *Gymnocarpium dryopteris* at this its most easterly site in the UK. We consider that it is now likely lost from the site and perhaps killed off by a hard winter. Jon paid particular attention to some of the larger drains and rivers to check for any gaps in recording for the upper and lower ranges of species. These surveys revealed *Ranunculus baudotii* in the Lade Bank Drain (**TF3954**) and *Potamogeton praelongus* in the Cam, Great Ouse and Little Ouse. Jon and Martin Hammond undertook aquatic plant and water beetle surveys for the *New Life on the Old West* (NLOW) project which included many Cambridgeshire Fenland sites. This work produced interesting records for *Ranunculus aquatilis, Glyceria notata*, *Alopecurus aequalis* and *Groenlandia* as well as finding a small population of *Carex vesicaria* from old ponds (Elford Closes).

***Isolepis setacea*, at water's edge of pond, Woodwalton Fen NNR © Pete Stroh (June 2021)**

Richard Lansdown surveyed a number of larger drains in early September and found a large population of *Potamogeton compressus* in the Middle Level Main Drain close to Wiggenhall St Mary The Virgin. This is a significant new population and the furthest downstream from the nearest population at March. Jon undertook a brief late season survey of the section between March and Wiggenhall (by stopping at bridges) to see if there were other populations of *P. compresses* but only found it in an additional tetrad upstream of Richard's site. 2021 was a big year for *Azolla* with numerous people reporting bank-to-bank stands on many of our larger drains and rivers by September, including the Witham from Chapel Hill nearly to Boston. The late Richard Chadd provided us with many records and useful information to update our species account.

The Cambridgeshire Flora Group (CFG) made three excursions into Fenland 2021, focussing on some of the most species-rich sites in our region. In May 2021, they explored the King's Dyke Nature Reserve near Whittlesey, both showing the continued presence of many calcicolous plants that are very local in Fenland and discovering Common Twayblade (*Neottia ovata*) for the first time, previously only known at Lattersey in this part of Fenland. In September, the CFG went to the classic 'Cambridgeshire Coast' sites at Foul Anchor and Tydd Gote, partly with the intention of assessing the status of two renowned rarities. Happily, they found both survived: a) *Bupleurum tenuissimum* was down to just three plants in a sward of *Elymus athericus*; and b) a count of *Spiranthes spiralis* revealed 127 spikes (see picture) on the Cambridgeshire part of the bank (the population overlaps with Lincolnshire and the total may be in excess of 200). On the banks of the North Level Main Drain, they discovered one plant of the hybrid between *Erigeron acris* and *E. canadensis* (*i.e. E. x huelsenii*); this hybrid is known in six sites in Cambridgeshire and Huntingdonshire and should be looked for elsewhere. Finally, the commons around Soham and the other SSSI meadows are among the highest quality grasslands in Fenland. The CFG visited Wet Horse Fen in October, following Jon Graham and Pete Stroh in May.

***Spiranthes spiralis* in short mown turf beside Tydd Gote pumping station © Jon Graham (September 2021)**

CFG excursions are often led by Jonathan Shanklin (BSBI vice-county recorder) and Alan Leslie (author of the magnificent 2019 flora). Jonathan continues to range widely in Cambridgeshire (and the neighbouring vice-counties), making comprehensive surveys *e.g.* with Lucy Wilson looking at species-rich calcicolous grassland on the banks of the North Level Main Drain. Elsewhere, he added to our knowledge of 'difficult' species, finding another site for *Crataegus heterophylla* near Over and *Rumex x dufftii* (*R. obtusifolius x R. sanguineus*) near Horningsea. Alan found a fascinating winter-wet area on the site of a former chicken farm, at Broad Lane, Cottenham (**TL4468**), with two intergeneric hybrids involving *Agrostis stolonifera* and *Polypogon* species *i.e. x Agropogon lutosus* (with *P. monspeliensis*) and *x Agropogon robinsonii* (with *P. viridis*). At the same site, on drier ground, he found two clumps of *Carex buchananii*, a sedge native to New Zealand. Other botanists who contributed records for the Cambridgeshire Fenland in 2021 include Oliver Glenister around Ely and on the Ouse Washes. Jo Parmenter crossed the border from Norfolk to survey a former orchard at Emneth and a variety of habitats near Isleham. The renowned aquatic botanist, Richard Lansdown, visited Cambridgeshire and the neighbouring parts of Norfolk, adding to our knowledge of rare and local pondweeds: *Potamogeton compressus* in the Middle Level Main Drain at Wiggenhall St Germans (**TF5813**) and P. praelongus in the Old Bedford (River Delph) near Earith (**TL3975, TL3976**) and in the 'Ten Mile River' near Denver Sluice (**TF5800, TF5801**).

Adam Lucas continued his painstaking examination of the Boston area, newly adding the False Alkanet (*Cynoglottis barrelieri*) from southeast Europe to the list of Fenland plants. Bill Meek, a former inhabitant of Whittlesey and a formidable all-round naturalist, has been conducting a monitoring study of arable sites around Fenland with UKCEH. Near Vacherie Lane, North Kyme, he found *Bromus secalinus* (at an arable margin) and *Carex vesicaria* (in a ditch).

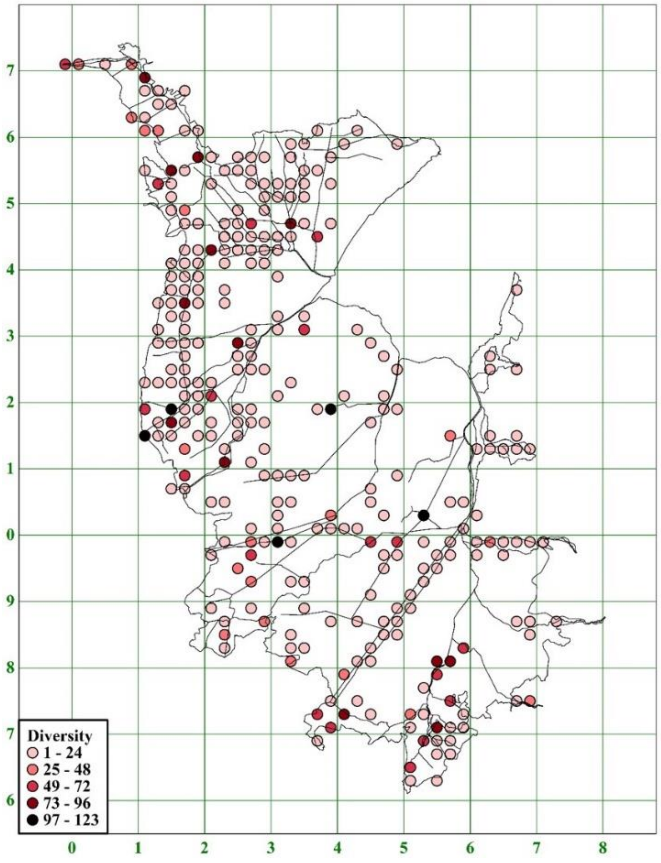
Bryophytes

Jon and Chris Preston continued with collating of records for a Fenland checklist of bryophytes as well as undertaking 2020/2021 winter excursions square-bashing in poorly-recorded areas. Bryologising in under recorded open Fenland can be tough at the best of times (we once recorded only 11 species in a tetrad!). However, square-bashing has continued to provide a steady stream of useful new records and a trip to Kings Dyke Nature Reserve found *Weissia longifolia var. longifolia* as well as the calcicole *Campyliadelphus chrysophyllus* growing bizarrely with the calcifuge *Polytrichum juniperinum* in a rabbit-grazed field cleared of scrub.

In April, Jon and Pete visited Woodwalton Fen and were able to update our records for a suite of classic fen species (including *Bryum pseudotriquetrum, Climacium dendroides, Drepanocladus aduncus* and *Plagiomnium elatum)* and Owen and Jon (on Owen's first trip out after his Romanian exile) looked at the vegetation of some newly dug ponds at Holme Fen. Although the aquatic flowering plant flora of these new ponds was disappointing, the disturbed peaty banks had a few weedy bryophytes (including *Leptobryum pyriforme, Marchantia polymorpha, Bryum rubens* and *Ceratodon purpureus*) while a better find was a single tuft of *Isothecium myosuroides* on the trunk of an old birch tree. Owen, Pete and Jon visited Wicken Fen in early May where we included a search for *Sphagnum* in many of its previously known sites in birch scrub. We found favourable-looking habitat in many places but no *Sphagnum* (*Sphagna* being absent now since 2003, Preston & Hill, 2019). However, while looking at the ground under *Cladium* we did update our records for several calcicole mosses (including *Camplylium stellatum, Fissidens adianthoides, Ctenidium molluscum* and *Bryum pseudotriquetrum).* Jon's visits to larger drains and rivers (described above) also provided a number of useful records of aquatic and shoreline species including *Drepanocladus aduncus, Fontinalis antipyretica, Leptodictyum riparium, Oxyrrhynchium speciosum, Pellia endiviifolia* and *Riccia fluitans* as well as a sizable fruiting population of *Physcomitrium pyriforme* at the water's edge of a field drain adjoining Baston Counter Drain (Willow Tree Farm).

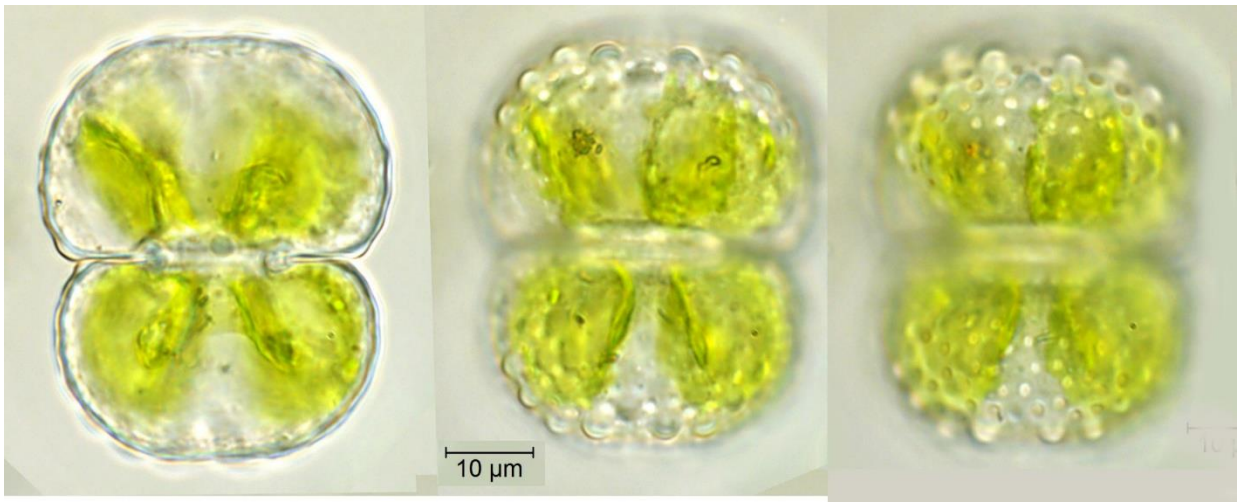
***Physcomitrium pyriforme* at Willow Tree farm © Jon Graham (April 2021)**

Algae



Fenland tetrads where we have collated algae records showing number of species recorded

Chris Carter and Jon are continuing working on the truly daunting task of compiling a Fenland algae checklist which will focus strongly on aquatic species, particularly diatoms (due to their importance in characterising the trophic status of watercourses) as well as macro-algae (*Cladophora, Vaucheria, Ulva etc*.) which are a prominent part of the biomass of Fenland drains. The final *Fenland Flora* will include full accounts for the *Characeae* with coverage maps. Highlights so far have included two new British Isles records: *Vaucheria schleicheri* and the desmid *Cosmarium pseudoinsigne.* A number of essentially marine taxa have been found at Pondersbridge, an observation that invites speculation and further measurements of water-chemistry. We have collated important Environment Agency records for diatoms while most significant new records being based on Jon collecting samples and posting them to Chris to check. Identifying algae from samples is a slow process and almost all species require microscope work for an accurate ID. Current taxonomy and nomenclature for algae are particularly challenging, since many species have no agreed name, and ongoing molecular, morphological and biogeographic work is revealing many cryptic species within what were previously single taxa. However, we consider that even an overview of Fenland algae will be a useful addition to the flora. Notable stonewort records in 2021 included *Chara aspera* and *Chara hispida* (King's Dyke Nature reserve), and an updated record of *Chara aculeolata* (Verrall's Fen, Wicken Fen NNR). In Lincolnshire, the BSBI vc 53 recorder Sarah Lambert surveyed the Pensfield NR, right on the Fenland edge near Langtoft (**TF1312, TF1313**) finding a variety of stoneworts (*Chara aspera s.s., C. curta* and *C. virgata*).



***Cosmarium pseudoinsigne* © Chris Carter (August 2018)**

Plan for 2022-23

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) Get sample quotes on costings from designers/publishers
2) 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)
3) Draft contextual chapters – (completion by winter 2022/23) – see Progress report 2020-21 *i.e.*
    - 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 (ca 40% complete)
7. Completion of draft flora – early summer 2023
8. Publication – 2023

Published output from the Fenland Flora in 2021:

Mountford, J.O. and Graham, J.J. (2021). *Diplotaxis erucoides* – the 'Cabbage-patch Rocket': the spread and status of a speciality of the Lincolnshire Fenland. *The Lincolnshire Naturalist* (Transactions of the Lincolnshire Naturalists' Union) **30(2):** 76-78.

The Fenland Flora Database is now 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 post at least one more annual newsletter about the progress of Flora production.

We wish you happy botanising in 2022 and beyond, and record our thanks to you all for records, access, information and encouragement over the past years.

Jon and Owen, 10th February 2022

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

***Sium latifolium* at Woodwalton Fen © Pete Stroh (September 2021)**

Fenland Flora coverage on 1st February 2022
Numbers of species recorded since 2000