The Flora and Vegetation of Hothfield Heath

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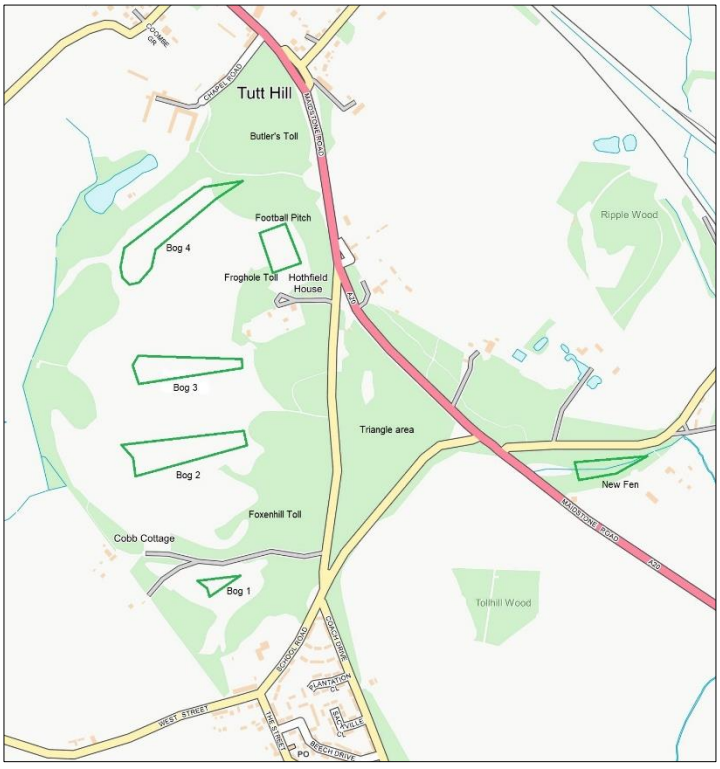
Introduction

Hothfield Heath is one of Kent's most popular wildlife sites. It is a small area of heathland on sandy soil with springs that seep nutrient-poor, acid water into a series of mires that are dominated by bog-mosses: a highly unusual habitat in a county of chalk downland. It has been studied intensively by naturalists for nearly two hundred years, and the reams of information that have been collected can be confusing and sometimes contradictory. The purpose of this report is to gather together all the botanical records and bring them up to date, and thus provide a comprehensive guide to the plants and vegetation of this site and how they have changed over the years. The report is aimed at naturalists, ecologists, conservationists and land managers.

The subject of this project is Hothfield Heath, as shown on the Ordnance Survey map, which corresponds closely to the former area of Common Land, the Wildlife Trust/Ashford Borough Council Local Nature Reserve, and the SSSI boundary. The correct name to use for this site is a matter of debate. It is listed as Hothfield Common on the Ordnance Survey map, but that is not ideal: it is no longer common land and it is not in any way a functioning common, so that title is only of historical relevance. The earliest botanists used the name Hothfield Heath (as well as Hothfield Common, or simply 'Hothfield') for their records, and this name therefore has some advantage of continuity. Other possible names, such as Hothfield Bogs or Hothfield Nature Reserve seem to offer no advantage, and it would seem strange to apply a description like 'bogs' to the areas of dry grassland, or 'nature reserve' when referring to records that pre-date the existence of such spaces. Overall, therefore, I suggest that Hothfield Heath best describes the area intended, and is the most likely to have both historical and future application.



There are several compartments to the site. The main area with the four bogs lies to the west of School Road. Between School Road and the A20 is a wooded area that is roughly triangular in shape, and which is referred to here (and elsewhere) as the triangle area. It is mostly a dry, wooded compartment but with hints of a wetland flora in places. On the east side of the A20 Maidstone Road is the New Fen, a bog that was once equal to those in the main area, but which is now rather overgrown and degraded (although it still retains some important species). North of this, across Watery Lane, is a small compartment which seems to consist of dry Sweet Chestnut woodland.

I am grateful to everyone who has recorded plants or written about the flora and ecology of this site and made their findings public, and to everyone who has helped by supplying information, commenting on the text, or offering their opinion. Hopefully, this report will be a useful contribution to the ongoing study of this site. It is freely available for downloading at the Internet Archive website, www.archive.org.

History of recording

The first mention of Hothfield in the botanical literature seems to be a record of *Geum rivale*, Water Avens, 'in a wood near Barber's Mill on Hothfield' in Edward Jacob's Plantae Favershamienses, 1777. Barber's Mill no longer exists, and I have not managed to trace its location, but it may have been on the River Stour and, as there were no woods on Hothfield Common at that time, it seems very unlikely that the record relates to our site. *Geum rivale* does, however, appear on later lists of plants of Hothfield, and all such records seem to derive from this source. This species has never otherwise been recorded in Kent and unless further evidence appears, it can safely be disregarded as a plant of the heath.

In 1829 Rev G.E. Smith produced his Catalogue of the Plants of South Kent, which mentions three species on Hothfield Heath. He subsequently added four more in Cowell's Floral Guide to East Kent, published in 1839. The later records probably date from 1830-1832 (G. Kitchener *pers. comm*.) and the earlier ones are presumably from shortly before 1829. The species he listed are an eclectic selection of some of the rarest plants in the county, and represent bog, heath and grassland habitats.

Species recorded by G.E. Smith, ca. 1828-1832

Lysimachia minima	Chaffweed
Cuscuta epithymum	Dodder
Lycopodiella inundata	Marsh Clubmoss
Nardus stricta	Mat-grass
Narthecium ossifragum	Bog Asphodel
Trifolium glomeratum	Clustered Clover
Ulex minor	Dwarf Gorse

The philosopher and botanist John Stuart Mill (1806-1873) collected three specimens at Hothfield, according to Hanbury & Marshall's Flora of Kent (1899). These are probably at Kew (**K**) so we might eventually get their correct dates. We know he collected in Kent between 1843 and 1870, so we can fairly confidently date the list to before 1870. The plants he found were *Carex pilulifera*, *Drosera rotundifolia* and *Trifolium subterraneum*.

The next records that we have with precise dates are by Frederick Morgan Webb (1841-1880), who submitted lists to the Flora of Kent and whose herbarium is at the Natural History Museum (**BM**). Two of Webb's records are particularly interesting. First, his *Ulex gallii* was rejected by Hanbury & Marshall as merely a form of *U. minor*. At that time *U. gallii* was not known in the county, but it has subsequently turned up in several places and is now accepted as native. As it is there now and there is no reason to believe it has been introduced, it seems reasonable to conclude that Webb was in fact correct. Second, his *Ranunculus hederaceus* was accepted by Hanbury & Marshall and by all subsequent authors until now but, given that this species is difficult to distinguish from *R. tripartitus* and that both are very rare in the county, it seems quite possible that this was a misidentification. At any rate, it seems more sensible to conclude that *R. tripartitus* was present all along, than that one rare crowfoot disappeared and another took its place.

Species recorded by F.M. Webb, ca. 1875

Aira caryophyllea	Silver Hair-grass	Montia fontana	Blinks
Bidens cernua	Nodding Bur-marigold	Oenanthe fistulosa	Tubular Water-dropwort
Carex echinata	Star Sedge	Ornithopus perpusillus	Bird's-foot
Carex leporina	Oval Sedge	Polygala serpyllifolia	Heath Milkwort
Carex paniculata	Greater Tussock-sedge	Ranunculus tripartitus	Three-lobed Crowfoot
Danthonia decumbens	Heath-grass	Sagina apetala	Annual Pearlwort
Eleocharis multicaulis	Many-stalked Spike-rush	Scleranthus annuus	Annual Knawel
Epilobium palustre	Marsh Willowherb	Scutellaria minor	Lesser Skullcap
Erica tetralix	Cross-leaved Heath	Spergularia rubra	Sand Spurrey
Eriophorum angustifolium	Common Cottongrass	Stellaria alsine	Bog Stitchwort
Galium saxatile	Heath Bedstraw	Trifolium glomeratum	Clustered Clover
Isolepis setacea	Bristle Club-rush	Trifolium subterraneum	Subterranean Clover
Juncus bulbosus	Bulbous Rush	Ulex gallii	Western Gorse
Luzula multiflora	Heath Wood-rush	Viola canina	Heath Dog-violet
Marrubium vulgare	White Horehound		

In the Flora of Kent, William Rickman Jeffrey and his son, John Frederick Jeffrey (1866-1943), are described as having contributed their records after E.S. Marshall became editor in 1892, but it is likely that they were originally made some time before this. A specimen of *Lycopodiella inundata* at **BM** and **K**, collected by John, is dated 1884, and this seems a reasonable date to use for William's records as well.

Additional species recorded by W.R. Jeffrey, ca. 1884

Achillea ptarmica	Sneezewort	Lycopodium clavatum	Stag's-horn Clubmoss
Lysimachia tenella	Bog Pimpernel	Lythrum portula	Water Purslane
Carex demissa	Common Yellow Sedge	Menyanthes trifoliata	Bogbean
Carex pilulifera	Pill Sedge	Molinia caerulea	Purple Moor-grass
Carex rostrata	Bottle Sedge	Pedicularis sylvatica	Lousewort
Filago minima	Small Cudweed	Petasites hybridus	Butterbur
Genista anglica	Petty Whin	Verbascum blattaria	Moth Mullein
Helosciadium inundatum	Lesser Marshwort	Veronica scutellata	Marsh Speedwell
Hypericum elodes	Marsh St John's-wort	Viola palustris	Marsh Violet
Juncus squarrosus	Heath Rush		

George Dowker (1828-1899) was a local man from Stourmouth who made just one record at Hothfield, but a very interesting one: he collected *Potamogeton coloratus*, Fen Pondweed. We do not know the date of the record, but from other specimens of his we know he was active between about 1867 and 1893. Although he seems rather sidelined by the authors of the Flora of Kent, he was evidently highly knowledgeable and very competent. He was responsible for two of only three known records of this species at that time, and he also discovered *Potamogeton acutifolius* at Wickhambreaux, many decades before anyone else noticed it. Given that he collected a specimen, there can be little doubt that this record was correct, even though nobody has yet found it again. Dowker's herbarium appears to be at Cambridge (**CGE**).

Rev John Mitchinson (1833-1918) was headmaster of the King's School, Canterbury, from 1859 to 1873, after which he moved to Barbados and subsequently to Oxford. It seems likely that his records for Kent therefore date from some time before 1873. His only contribution to the flora of Hothfield is a record of *Potentilla palustris* (*Comarum palustre*), 'near Ashford.' Hanbury & Marshall (1899) suggest that 'Hothfield Heath is a likely location' but this does not seem sufficient evidence to include it.

The other records in the Flora of Kent include mostly refinds by Frederick Janson Hanbury (1851-1938) and some new species found by Edward Shearburn Marshall (1858-1919) in the 1890s.

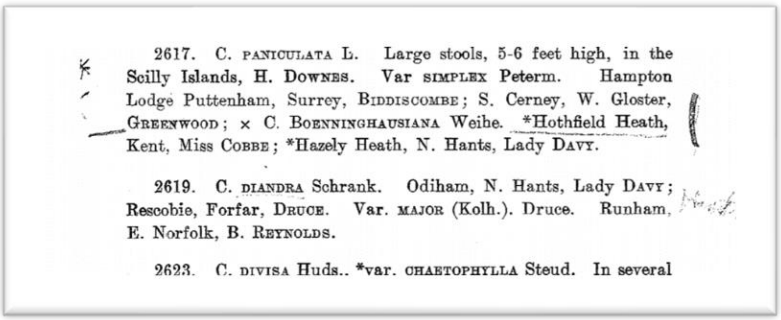
Additional species recorded by E.S. Marshall, ca. 1890s

Carex laevigata	Smooth-stalked Sedge	Polygonum aviculare	Knotgrass
Epilobium obscurum x palustre	a hybrid willowherb	Potamogeton polygonifolius	Bog Pondweed
Frangula alnus	Alder Buckthorn	Sagina procumbens	Procumbent Pearlwort
Galium uliginosum	Fen Bedstraw	Salix aurita	Eared Willow
Helosciadium nodiflorum	Fool's Water-cress	Spergula arvensis	Corn Spurrey

In the years up to 1902 Rev Henry W. Russell, the Rector of Hothfield, prepared a *History of the Village* of Hothfield in manuscript form, presumably with the intention of publishing a book. The manuscript is at Maidstone Central Library and has been transcribed by members of the Hothfield History Society. It includes a list of 'Some Plants on and about Hothfield Common,' which mentions about 110 species. It is obvious that the list is a compilation, because it includes E.S. Marshall's record of *Epilobium obscurum* x *palustre*, which could hardly have been recorded by anyone else, and it repeats the old one of *Geum rivale*.

One problem is that these are plants 'on and about' the common. Presumably this means it covers a wider area than the common itself and therefore includes things that do not concern us here. For the purposes of this report I have incorporated 74 species from Russell's list, which appear likely to refer to the common.

In 1923 a Miss Cobbe (probably Mabel (d. 1936) but possibly Amy (1866-1952)) collected the hybrid sedge *Carex* ˣ*boenninghausiana* (*paniculata* x *remota*), according to the Botanical Exchange Club Report for that year. This is not a rare hybrid and it could still be present, but many people have searched for it without success.



2617. C. PANICULATA L. Large stools, 5-6 feet high, in the Scilly Islands, H. DOWNES. Var SIMPLEX Peterm. Hampton Lodge Puttenham, Surrey, BIDDISCOMBE; S. Cerney, W. Gloster, GREENWOOD; × C. BOENNINGHAUSIANA Weihe. *Hothfield Heath, Kent, Miss COBBE; *Hazely Heath, N. Hants, Lady DAVY.

2619. C. DIANDRA Schrank. Odiham, N. Hants, Lady DAVY; Rescobie, Forfar, DRUCE. Var. MAJOR (Kolh.). Druce. Runham, E. Norfolk, B. REYNOLDS.

2623. C. DIVISA Huds.. *var. CHAETOPHYLLA Steud. In several

Extract from the Botanical Exchange Club report for 1923 (vol. 7 pt. 1, p. 219). This is a scan of Francis Rose's own copy, with the Kent record highlighted.

John Patrick Micklethwait Brenan (1917-1985) collected some mosses at Hothfield in January and February 1936, which are now at Cardiff (**BBSUK**). The bog-mosses are listed below.

J.P.M. Brenan's Sphagnum collection from 1936

Sphagnum compactum	Compact Bog-moss
Sphagnum cuspidatum	Feathery Bog-moss
Sphagnum denticulatum	Cow-horn Bog-moss
Sphagnum fallax	Flat-topped Bog-moss
Sphagnum papillosum	Papillose Bog-moss

Francis's Rose's *Bryophyte Flora of Kent*, published in three parts in the journal of the British Bryological Society (1949-1951) includes a description of the main bog (which is generally known as bog 2, but Rose used a different numbering system) from a bryological perspective. One would have to have some knowledge of bryology (including old nomenclature) to fully appreciate it, but for those who are interested it is worth including in full. This account includes some corrections by Rose from his copy of the published Flora:

> On Hothfield Heath grow nearly eighty species of bryophytes, of which number, five are today known nowhere else in Kent (these are marked * thus below). On the dry peaty heather moor, *Hypnum Schreberi*, *H. cupressiforme* var. *ericetorum*, and *Dicranum scoparium* are all abundant; *Dicranum spurium* appears to be absent here, though typical of such places in Surrey and Sussex. On slightly damper 'wet heath', *Ptilidium ciliare*, *Gymnocolea inflata*, *Campylopus brevipilus**, *Leucobryum glaucum*, *Dicranum Bonjeani* and *Hylocomium splendens* are locally abundant, with *Hypnum imponens** in one small area. Where conditions are permanently wet, the peat surface bears a close sward of various Sphagna, mostly *Sphagnum molluscum* and *S. papillosum*, over which grow epiphytically *Odontochisma Sphagni*, *Lepidozia setacea*, and *Cephalozia media*, while *Leptoscyphus anomalus* is frequent on the sides of peaty hummocks where drainage is better (pH 4.6). In the actual valley bog, *Sphagnum*, mostly *S. fallax*[1], bears various *Cephalozias*- (*C. bicuspidata*, *C. Lammersiana*, *C. media*, *C. connivens*, *C. macrostachya**, *C. fluitans**) and *Cephaloziella myriantha*, with *Calypogeia Trichomanis* and *C. sphagnicola** on its surface among *Narthecium*; *Aulacomnium palustre* is plentiful and fruits well, while *Hypnum stramineum** is frequent, creeping on the *Sphagnum*. The margins of boggy pools have a zone of *Aneura multifida* and *Calypogeia fissa* (elongated pool form), and below this a zone of *Aneura pinguis*. In the pools *Hypnum fluitans* grows among *Hypericum elodes* and *Potamogeton polygonifolius*, with a *Bryum* (apparently *B. bimum*). In the central rill of moving water, *Hypnum stellatum* is dominant, and this spreads into the bog. *Hypnum cordifolium*, *H. cuspidatum* and *Chiloscyphus polyanthus* occur as frequent species in less acid conditions (pH 5.3) with *Lysimachia tenella* lower down the bog with

[1] *Sphagnum pulchrum* in the original version, later corrected to *fallax*.

taller associates such as *Galium palustre*, *Myosotis secunda*, and scattered tussocks of *Polytrichum commune*. *Drosera rotundifolia* is most plentiful in the *Odontochisma-Lepidozia setacea* zone.

Around the same time (1940s) Rose began to compile data for a future Flora of Kent which he never completed. After his death in 2006 the notes were scattered but they have recently been retrieved and compiled by Geoffrey Kitchener, who has published them as a series of electronic documents which are online on the BSBI web site. The Flora (I have used v. 8, 2020) gives lists of plants by botanical district (using Rose's own boundaries, which differ from those in Hanbury & Marshall) and sometimes by site and grid reference, which enables us to be confident that the records for Hothfield Heath really were from this site. Using this manuscript Flora and other sources (some BEC Reports, the Herbaria at Home website, and Wildlife Trust records) I have found details of some 41 species of vascular plants seen by him at the Heath between 1942 and 1987. These include many of the species previously recorded here plus a few additions. It also reveals that he was involved in various fruitless efforts to reintroduce some lost species, including the clubmosses; although he was apparently not responsible for the *Pinguicula vulgaris*, Common Butterwort, which a certain Dr Scott said had been planted. As early as 1899, Hanbury & Marshall (pp. 269-270) had reported other attempts to introduce it in the county, dating back to the 17th century, but none had ever been successful.

In 1974 the Kent Field Club held a symposium on Hothfield Heath in which various papers were presented about the geology, soils, wildlife and management of the reserve. Of particular interest is Martin Pym's account of its history since the war, which shows how vital the role of the naturalists has been in protecting the area against roads, development and other threats.

Eric Philp (1930-2013), who was curator at Maidstone Museum and the BSBI Recorder for the county, contributed a list of all the species that had ever been recorded at Hothfield (Philp, 1975). This seems to include many plants from the surrounding countryside, presumably because recording at that time was often done by tetrad (2 km x 2 km squares). The same thing applies to both of Philp's Atlases of Kent, in 1982 and 2010. One can only guess which species were within the reserve and which were elsewhere, and so here I have only included the ones that have otherwise been recorded within the reserve.

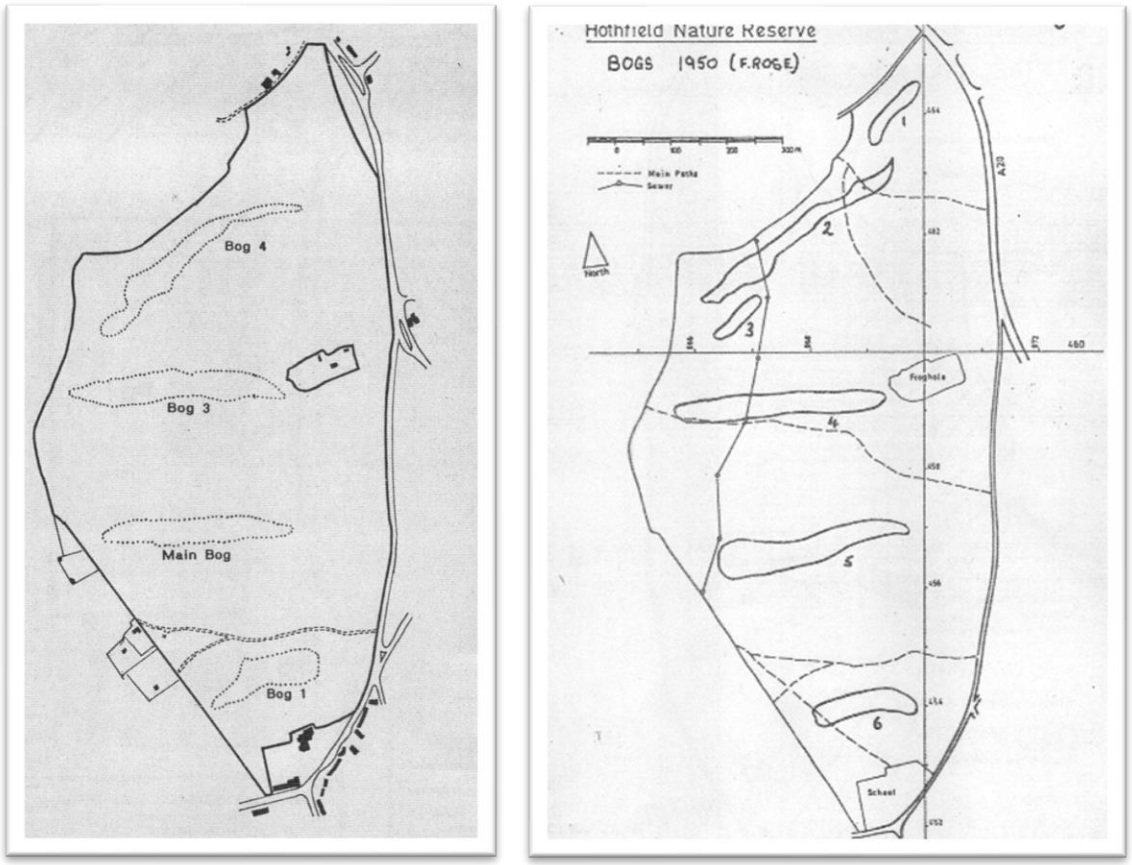
In 1994 *Ranunculus tripartitus*, Three-lobed Water-crowfoot, was discovered at Hothfield, in a vehicle rut in Bog 1. I have not been able to find out who made the discovery. This species is considered to be 'Endangered' and declining in Britain, and it was the subject of a Biodiversity Action Plan at the time. A survey by N.F. Stewart in 1998 showed that it was present in pools in three of the bogs: 1, 2 and 3. Short lists of associated species were also recorded.

Since 2010 there has been a new Kent Botanical Recording Group, making records with greater thoroughness than most previous surveyors. Unfortunately, many of these are by monad (1 km square), which again cannot always be localised to the reserve with much confidence, but the rarities are generally recorded precisely. Many new plants have turned up in the last decade or so, including native species, casuals, and a continual stream of apparently deliberate introductions. One of the more recent (and successful) of these has been Bog Myrtle, *Myrica* gale, which has been welcomed by the Wildlife Trust, although the Pitcherplant, *Sarracenia purpurea*, was rapidly removed. The introduction of Sea Stork's-bill, *Erodium maritimum*, in 2017 was probably inadvertent. However, in 2020 Musk, *Erythranthe moschata*, turned up in Bog 2; it seems unlikely to be a garden escape and may have been a deliberate, surreptitious, introduction.

Kent Wildlife Trust has also been active in recording on the heath. Their database, compiled by themselves and the Kent Biological Records Centre, was generously made available for use here. It adds several species and some precise locations to the previously compiled data.

Ecology and vegetation

Although the most distinctive feature of Hothfield is its bogs, it would not be entirely correct to describe it as a peatland. There is peat in the bogs, but it is a thin layer and it is possibly quite recent in origin. They are probably be described as valley mires, and they are fed by groundwater that has been filtered through the Greensand rather than being ombrotrophic (dependant entirely on rainwater). In places these mires have swamp (pH neutral) or fen (base-rich) vegetation. There are five 'bogs', although in the 1940s Francis Rose considered there to be seven. Three have merged into bog 4, which is the northernmost one, and the fifth (the New Fen, not shown on the plans below) is now better described as a swamp.



- The current bog numbering system (left) and Francis Rose's scheme.

Bog 1, at the southern end of the site, on the other side of a minor road, has been very overgrown with scrub, although it was impressively cleared and then grazed with ponies in 2019-2020. The habitat is much degraded, but there are still patches of *Sphagnum* throughout, and a large area of *Molinia caerulea*. A few stands of *Eriophorum angustifolium* show that it was once a genuine valley mire, whereas the vegetation there now is more suggestive of a heathy woodland. At the bottom (western) end of this bog there is a pond full of *Potamogeton polygonifolius*, which was the original site for *Ranunculus tripartitus* at Hothfield, although that pond has dried up in recent summers and the water-crowfoot has not reappeared.

The main bog is bog 2, and this is the best part of the site for the characteristic valley mire vegetation, with plants such as *Narthecium ossifragum*, *Drosera rotundifolia* and *Sphagnum papillosum*. There is a distinct hummock and pool structure, with runnels meandering through. Around the margin there is wet heathland grading into dry heath and bracken. A lot of effort by the Wildlife Trust has been focused on trying to keep this bog in good condition, and to a great extent they seem to have succeeded. At the bottom of bog 2 there is a concrete walkway (apparently enclosing a sewer pipe) which causes a sizeable pond to form above it. Normally

this is a good place for *Ranunculus tripartitus*, but in 2020 it dried up completely and there was no sign of water-crowfoot; although *Lythrum portula* was thriving on the bare mud.

Bog 3 is broadly similar, but a bit scrubbed-over and lacking some of the more distinctive bog species. In some years it contains a series of shallow pools with *Ranunculus tripartitus* in each, but in the last couple of summers these have been dry.

At the northern end is bog 4, which is the largest and most diverse one. At the top (north-eastern) end it is quite acid and consists of *Juncus acutiflorus* swamp with patches of *Menyanthes trifoliata* and *Equisetum fluviatile*. Here it has been invaded by *Crassula helmsii*, which has survived the application of black plastic sheeting but does not seem to thrive well enough to have spread anywhere else. Below the path the bog is deeper and perhaps more base-rich, with an extensive stand of *Carex paniculata* lining a small stream that spreads out into a wide, boggy wetland. Below that, the water drains into a stream that runs south along the boundary of the heath through an area of woodland.

The fifth bog is called the New Fen, which is situated on the far side of the A20 and is completely isolated from the rest of the site. It was once a valley mire like the others, but it is now a swamp of *Hydrocotyle vulgaris* and *Juncus acutiflorus* with stands of tall herbaceous plants amongst wet and dry woodland.

From a distance Hothfield Heath appears completely wooded, but many of the trees are concentrated around the edges. There is dry woodland on the hills or 'tolls,' grading into willow and alder carr in the wetlands. It is a constant battle for the site managers to try to keep the woodland in check, and considerable forests of saplings and suckers spring up wherever their attention had wavered for even a single season.

Another continuous struggle is with *Pteridium aquilinum*, which dominates the ground flora in the drier areas of woodland and extends into the heathland and grassland wherever it is left. At the 1975 Kent Field Club meeting, bracken was seen as the main threat to this site, although no effective solutions to the problem were identified.

Certain areas have evidently remained reasonably free from bracken and woodland, however. These tend to be the places where there is most footfall – down the main slope and the Froghill Slope, and along paths between these areas. Several species are largely restricted to these paths, including most of the acid grassland specialists. Grazing, spraying and hand cutting may have all contributed to the preservation of these areas, but it seems likely that people just walking their dogs has been one of the most consistent and effective ways of maintaining the sward. Plants such as *Danthonia decumbens*, *Nardus stricta*, *Juncus squarrosus* and *Montia fontana* owe their continued presence to trampling.

The heathland at Hothfield is quite patchy. Much of it could be described as grass-heath or heathy woodland, but there are some areas in the middle where dwarf shrubs such as *Calluna vulgaris* and *Ulex minor* form a more recognisable heath. The main threat in these areas is *Ulex europaeus*, which quickly takes over to form scrub.

Vegetation Communities

The vegetation at Hothfield includes valley mire, wet and dry heath, acid grassland, various types of swamp, and dry woodland.

Perhaps the most distinctive community is the valley mire in the main bog (B2), which has M21 *Narthecium ossifragum* community (Q1202 & Q1203) in the middle, where the water is most acid and there are hummocks of *Sphagnum*. This is where *N. ossifragum* and *Lysimachia tenella* are abundant. It is defined best by the presence of *Sphagnum papillosum* hummocks. Weaving through the bog are channels of M29 *Hypericum elodes-Potamogeton polygonifolius* community (Q1200). This typically contains patches of bare peat and lawns of *Sphagnum fallax*, and it is distinguished from the other communities by the lateral movement of surface water. Surrounding the core is an expanse of M6 *Carex echinata* mire.

None of these communities was recorded in Kent in *British Plant Communities* (Rodwell, 1991-2000) but their presence in the county is suggested as likely in the community descriptions. Hothfield is undoubtedly the best, and possibly the only site in the county for several of them.

Bog 4 is intriguing and more complex. There appear to be three main components to the vegetation: stands of tussock-sedge in the middle, patches of *Sphagnum*-rich bog, and a broad swathe of low-growing rushy vegetation surrounding these. The rush vegetation is mostly M23 *Juncus acutiflorus*/*articulatus* rush-pasture (Q1199), but above the path there is a more acid community which I think is M9 *Carex rostrata* mire (Q1242), with *Menyanthes trifoliata* and *Equisetum fluviatile*. Some parts of B4 (Q1209) taken in the boggy areas suggest that it is M29 *Potamogeton polygonifolius* community; I don't think there is any M21 there. The *Carex paniculata* stands are a curiosity. On the one hand, they could be said to be obvious examples of S3 *C. paniculata* swamp, and they certainly match the description in almost every way. On the other hand, this is one of the weakest communities in the NVC, floristically, and it is almost impossible to demonstrate its presence through analysis of the data. Where the tussock sedge has been grazed (Q1263), it appears just a form of M23; where it forms tussocks (Q1206), it is more like W1 *Salix atrocinerea* woodland. Possibly the best solution is to say that any areas of large tussocks are indeed S3, as long as one remembers that this sedge alone determines the community, and that nothing else distinguishes it.

After the bogs, it is the acid grassland that is most distinctive at Hothfield. As far as I can make out, this is all U1 *Rumex acetosella* grassland, although it is very diverse and species-rich in places. There are lots of tiny plants and spring ephemerals such as *Montia fontana* (Q1222) and *Cerastium semidecandrum* (Q1204) which can easily be missed. The main grasses can be either *Festuca ovina*, *Agrostis capillaris*, *Aira praecox* or *Deschampsia flexuosa*. Most areas of grassland are patchy and rather scrubbed over, and it is really trampling by people rather than grazing or mowing that has maintained this habitat over the years.

The acid grassland grades into heath in places, with increasing quantities of dwarf shrubs such as *Calluna vulgaris* and taller shrubs such as gorse (three species of *Ulex*). These communities need further study.

Finally, woodland dominates about half of the total area of the reserve. It ranges from neutral W10 *Quercus robur* in the west (Q1232) to slightly base-rich W8 *Fraxinus excelsior* (Q1220) in the triangle area. On Foxenhill Toll there is some mature beechwood which could be described as W14 *Fagus sylvatica – Rubus fruticosus* woodland. There is, perhaps surprisingly, no acid woodland.

Conservation Value

Hothfield Common SSSI was designated in 1951 (and renotified in 1985 under the Countryside & Wildlife Act 1981) as the best example of a valley bog in Kent, with associated heathland. The SSSI statement mentions that the diversity of invertebrates and birds is important, as well as twelve (un-named) species of *Sphagnum* and a number of vascular plants. The following are specifically listed:

Species mentioned in the SSSI statement

Calluna vulgaris
Carex paniculata
Carex pulicaris
Drosera rotundifolia
Erica tetralix
Eriophorum angustifolium
Erophila verna
Genista anglica
Hypericum elodes
Juncus squarrosus
Menyanthes trifoliata
Molinia caerulea
Narthecium ossifragum
Ornithopus perpusillus
Trifolium glomeratum
Ulex minor

These species are essentially axiophytes: plants that strongly indicate a habitat of conservation importance. A modern list of axiophytes, drawn up by the Kent Botanical Recording Group, gives as many as 122 which have been recorded at Hothfield over the years. They include the bog-mosses, *Sphagnum* spp., of which 14 have now been recorded.

Just counting the axiophytes is a reasonably good way of assessing a site. More than about 30 indicates that it warrants SSSI status, so Hothfield more than qualifies on those grounds. However, one can find out more about a site by assigning the axiophytes to habitats. This reveals information about the relative value of the different habitats, as well as highlighting any changes if there is time-series data. It turns out that bog plants are best represented among the axiophytes (44 species) and there have been very few, if any, losses (symbolised by a dagger †). Eared Willow (*Salix aurita*) is conceivably still present, certainly as a hybrid with Grey Willow. *Aneura mirabilis* and *Sphagnum flexuosum* are very obscure taxa that would be easily missed. The only real loss is *S. tenellum*, which was so far beyond its range here that the climate is probably the main cause. This shows that the bog habitat has been well protected by the management.

Bog axiophytes

Lysimachia tenella
†Aneura mirabilis
Aneura pinguis
Aulacomnium palustre
Carex echinata
Carex laevigata
Carex panicea
Carex paniculata
Carex pulicaris
Carex rostrata
Dactylorhiza maculata
Dactylorhiza praetermissa
Drosera rotundifolia
Dryopteris carthusiana
Eleocharis multicaulis
Epilobium palustre
Equisetum fluviatile
Erica tetralix
Eriophorum angustifolium
Hydrocotyle vulgaris
Hypericum elodes
Isolepis setacea
Juncus bulbosus
Menyanthes trifoliata
Myosotis secunda
Narthecium ossifragum
Potamogeton polygonifolius
Ranunculus flammula
†Salix aurita
Scutellaria minor
Sphagnum capillifolium
Sphagnum cuspidatum
Sphagnum denticulatum
Sphagnum fallax
†Sphagnum flexuosum
Sphagnum inundatum
Sphagnum magellanicum
Sphagnum papillosum
Sphagnum subnitens
†Sphagnum tenellum
Stellaria alsine
Triglochin palustris
Veronica scutellata
Viola palustris

The second most important habitat is grassland, which is represented by 26 species, but the losses are much greater. Nearly half of the axiophytes recorded have disappeared and others have become so scarce that they may turn out to have been lost by now. This is probably due to the way that the grassland has been swamped by bracken in many areas or has succeeded to scrub and woodland. Prior to 1975, the key area for grassland plants was apparently on the mown road verges.

Grassland axiophytes

†Aira caryophyllea
Aira praecox
Anacamptis pyramidalis
Campanula rotundifolia
†Lysimachia minima
†Cerastium arvense
†Cuscuta epithymum
Danthonia decumbens
Deschampsia flexuosa
Festuca ovina
†Filago minima
†Lepidium campestre
†Moenchia erecta
Montia fontana
Myosotis discolor
Ornithopus perpusillus
Plantago coronopus
†Rhodobryum roseum
†Scleranthus annuus
†Spergula arvensis

Spergularia rubra	Trifolium glomeratum	Trifolium subterraneum
†Thymus pulegioides	Trifolium ornithopodioides	Trifolium suffocatum

Heathland plants are also well represented, with 24 species. The habitat varies from dry to wet heath, and the boundaries between this habitat and both bogs and grassland are particularly vague, but the following seem the ones best assigned to this category. A quarter of these species have been lost, presumably from the same causes as the grassland.

Heathland axiophytes

Calluna vulgaris	Galium saxatile	†Lycopodium clavatum	Potentilla erecta
Carex binervis	†Genista anglica	Lythrum portula	†Sphagnum compactum
Carex demissa	Hypericum humifusum	Molinia caerulea	Succisa pratensis
Carex nigra	†Hypochaeris glabra	Nardus stricta	Ulex minor
Carex pilulifera	Luzula multiflora	Pedicularis sylvatica	Veronica officinalis
Ceratocapnos claviculata	†Lycopodiella inundata	Polygala serpyllifolia	†Viola canina

Marshland is another possible category of habitat that one could use to describe Hothfield. These (12) species often occur in more neutral wetland than bog or wet heath. At Hothfield they are mostly found in the bogs, though, and it might not be worth having this as a separate category. The *Juncus acutiflorus* may all be *J.* x*surrejanus* now, although presumably the pure species was once present. A third of these species have been lost, but the numbers are low.

†Achillea ptarmica	Eleocharis palustris	Juncus acutiflorus	Silene flos-cuculi
†Bidens cernua	Glyceria notata	†Oenanthe fistulosa	Sphagnum palustre
Carex pseudocyperus	†Helosciadium inundatum	Scirpus sylvaticus	Sphagnum squarrosum

The existence of fen at Hothfield is a moot point. Bog 4 is often described as being a fen rather than a bog, but the difference is subtle. The only strictly fenland axiophytes that have been recorded, *Galium uliginosum* and *Potamogeton coloratus*, are both long gone, if indeed they were ever present.

Finally, there are 15 ancient woodland axiophytes recorded. They have all been seen quite recently, and it seems likely that this habitat has gained rather than lost species in recent decades. The list is not long enough to make a case for Hothfield being a particularly rich ancient woodland site, although it would be a fair assumption that some balance between woodland and more open habitats has been a feature of the area for centuries.

Woodland axiophytes recorded at Hothfield

Adoxa moschatellina	Dryopteris affinis	Poa nemoralis
Anemone nemorosa	Frangula alnus	Populus tremula
Athyrium filix-femina	Hyacinthoides non-scripta	Sphagnum fimbriatum
Caltha palustris	Hypericum pulchrum	Veronica montana
Chrysosplenium oppositifolium	Neottia ovata	Viola reichenbachiana

This division of axiophytes into broad habitats reinforces the view of Hothfield as a site of importance primarily for its bogs; but also, surprisingly perhaps, it shows that acid grassland is (or was) almost equally significant here. This can be explained by the geology, as it is the presence of the aquifer within the Greensand Folkestone Beds that creates the acid springs which allow the bogs to exist. The sandy soil that this rock produces supports some unusual plant communities. Several of the species found at Hothfield, for example, would normally be expected on beaches or coastal dune systems.

The lists of axiophytes at Hothfield can also be used to monitor the overall conservation value of the site. It is unrealistic to expect any site to always have all the plants that ever occurred there, but it is not impossible for the number of axiophytes at any one time to remain more-or-less constant. This is indeed the case at Hothfield, where losses of grassland and heathland plants have almost been offset by apparent gains in woodland plants. Part of this effect is simply that we record more species now than they did in the past.

Numbers of axiophytes recorded in each date class

<1970	98
<1990	74
<2010	91
>2010	90
Total ever:	122

Rare plants

While axiophytes or their equivalents are perhaps the most-commonly used and informative way of assessing the conservation importance of a site, rarity is another criterion that is often taken into account. But 'rare' can mean many different things. At one end of the scale are plants that have a small global population, while at the other there are plants which could be globally very common but scarce in a particular region.

One of the plants most often cited as rare at Hothfield is the liverwort *Pallavicinia lyellii* (Hook.) Carruther., which was found in the main bog (B2) by Sylvia Priestley in 2002. It is a plant of moist sandstone rocks and shaded bogs, with only a dozen or so known sites in Britain (mainly in the south and west). However, although it is apparently a rare (or overlooked) plant in Britain, it is widely distributed throughout the world, including in Asia, America and Oceania. Therefore, although it is of interest to bryologists, one could argue that it does not merit any special attention here.

Ranunculus tripartitus is rather more promising. Although it occurs in slightly more sites in Britain (about 33 hectads, which makes it Nationally Scarce), it has a much more restricted global distribution, in Europe and North Africa. It is a plant of pools and wet hollows in heathland, and it is not normally considered a bog plant. At Hothfield it occurs in a pool at the bottom of the main bog and in a good year in several wet hollows in bog 3. It is reasonably abundant. Bluebell, *Hyacinthoides non-scripta*, is similarly limited in its world distribution, being largely confined to NW Europe, but it is of course a very common and widespread species in Britain.

Many of the bog plants at Hothfield are distinctly rare in the local context, and several of them are found in no other site in Kent (or in East Kent, even more so). However, all of these plants are reasonably widespread in Britain and, for a peat bog enthusiast, Hothfield is of no great significance except for its position at the very SE extremity of the range of this habitat. This highlights one of the biggest issues for the site: the difficulty of maintaining such a habitat in an unfavourable climatic zone, and it is likely to become increasingly problematical if the climate continues to warm.

There are some species at Hothfield that are of more importance nationally than locally. These are the dry grassland plants such as *Trifolium glomeratum*, *T. ornithopodioides*, *T. subterraneum* and *T. suffocatum*. They are each much rarer than, say, *Carex panicea* or *Sphagnum fallax* in Britain, but common enough locally that they do not seem all that remarkable. The grassland habitat at Hothfield has not been the focus of as much attention as the bogs or heaths, but if one were drawing up a list of significant sites nationally, it is arguably for this habitat that it would be selected.

There are (or were) some 46 species at Hothfield that are listed on Geoffrey Kitchener's Kent Rare Plant Register (2019 version), and detailed accounts of each of these species in Kent are available from the Kent Botanical Recording Group.

Plants recorded at Hothfield that are on the Kent Rare Plant Register

Calluna vulgaris	Carex nigra	Carex rostrata
Campanula rotundifolia	Carex panicea	†Cuscuta epithymum
Carex echinata	Carex pulicaris	Dactylorhiza maculata

Drosera rotundifolia
Eleocharis multicaulis
Epilobium palustre
Erica tetralix
Eriophorum angustifolium
†Galium uliginosum
†Genista anglica
†Helosciadium inundatum
Hypericum elodes
†Hypochaeris glabra
Juncus squarrosus
†Lepidium campestre
†Linum radiola
Lysimachia tenella
†Moenchia erecta
Myosotis secunda
Myrica gale
Nardus stricta
Narthecium ossifragum
Pedicularis sylvatica
Polygala serpyllifolia
Ranunculus flammula
Ranunculus tripartitus
†Scleranthus annuus
Silene flos-cuculi
Spergula arvensis
Succisa pratensis
Trifolium glomeratum
Trifolium suffocatum
Triglochin palustris
Ulex gallii
Veronica officinalis
Veronica scutellata
†Viola canina

The plants on this list that are still present could be used for monitoring purposes, or the axiophytes would serve the same purpose.

In summary, Hothfield Heath has an extraordinary conservation status. For such a small area, 100 or so species of axiophyte is an exceptionally high number, and the rarities are similarly diverse. There is considerable evidence of a decline in the quality of the grassland and grass-heath, but the bogs have fared well since the site has been managed for conservation. Owing to its accessibility and popularity, it is a truly outstanding nature reserve with value for education and health as well as scientific interest.

Species List

Species square brackets are those which I believe have been recorded within the site, but which I have not yet seen or been able to confirm. Anything which has not been seen for a long time is given a dagger (†) to indicate that it is probably no longer present.

Bryophytes

A complete list of bryophytes is beyond the scope of this work, but certain species are worth mentioning because they are of particular importance, or because they can be observed by the general botanist and therefore used for monitoring purposes.

The bog-mosses (*Sphagnum* spp.) are the most important component of any mire, making up a large part of its bulk and modifying the environment, so here they are included in full detail. Unfortunately, they can be very difficult to identify reliably, so information about them is sketchy.

Pallavicinia lyellii (Hook.) Carruth., Veilwort is a scarce liverwort which grows in the bogs, amongst *Sphagnum*, or in tussocks of *Molinia caerulea*. It has been recorded in bog 2 by J.G. Duckett in 2002 and J.I. Hendey in 2006. This is a thallose liverwort rather similar to *Pellia* or *Aneura* in appearance which was thought to be rare in Britain and confined mainly to the south-east, but it has been recorded more widely in recent years, according to the NBN Atlas.

Aneura pinguis (L.) Dumort., Greasewort: occasional in the bogs. This characteristic bog plant would make a useful indicator of the state and extent of the bogs if it could be reliably separated from similar thallose liverworts. Although it is quite common nationally, it is very rare in East Kent. It was first recorded at Hothfield by L.J. Cocks in 1906 and there are recent records of it in bogs 2 and 4.

Aneura mirabilis (Malmb.) Wickett and Goffinet, Ghostwort: a liverwort which occurs underground, usually under a layer of *Sphagnum*, and which naturally has no chlorophyll. It is highly characteristic of peat bogs and is considered to be very rare. It was found at Hothfield in the 1980s by J.G. Duckett.

Sphagnum papillosum Lindb., Papillose Bog-moss: one of the more significant bog species, often (with *S. capillifolium*) making up the hummocks that are raised above the water level. It is reasonably common in the middle of bog 2 (the main bog). It is a strong axiophyte of raised and valley mires, and Hothfield is its only site in Kent.

Sphagnum palustre L., Blunt-leaved Bog-moss: frequent around the edges of bog 4, TQ968462. This species is tolerant of more mineral-rich water than many of the others and often grows in flushes and wet heaths rather than on the ombrotrophic parts of a bog. It is one of the more common and widespread species of bog-moss.

[*Sphagnum magellanicum* Brid., Magellanic Bog-moss: one of the most specialised of all the bog-mosses, it was recorded here in 1950 (T. Laflin), 1968 (F. Rose) and 2002 (J.G. Duckett). This is possibly its only site in Kent.]

Sphagnum squarrosum Crome, Spiky Bog-moss: in patches on the edges of bog 4. This species is typical of mineral-rich flushes and pools on the edges of mires, rather than ombrotrophic bogs.

[*Sphagnum fimbriatum* Wilson, Fringed Bog-moss: listed in Francis Rose's *Bryophyte Flora* in 1951 and subsequently recorded by J.I. Hendey in recent years. It is a plant of boggy woodland and would not normally be expected on the mire unless it had been scrubbed-over for some time. In some places it can persist on an open mire, in which case its presence can be a useful indicator of the progress of the restoration.]

Sphagnum capillifolium (Ehrh.) Hedw., Red Bog-moss: occasional in bogs 2 & 3, where it is the main constituent of hummocks raised above the water level. The plants are often a distinct red colour. It has been known here since at least 1948 (F. Rose). Both ssp. *capillifolium* and ssp. *rubellum* occur in bog 2 – the former makes very dense hummocks with closely-packed heads, whereas the latter is more spreading.

Sphagnum subnitens Russow & Warnst., Lustrous Bog-moss: frequent in bogs 2 & 4, where it is the first species to form hummocks rising out of the *S. fallax* lawn. In the more acid parts of bog 2 it is replaced by *papillosum* and *capillifolium*.

†*Sphagnum compactum* Lam. & DC., Compact Bog-moss: this is a plant of bare peat, usually found in wet heathland rather than deep, spongy bogs. Prof. Brenan, however, described it as being in a 'peaty bog' in 1936 and it does seem that the bogs at Hothfield have a lot of bare peat, which is more typical of heath than of a valley mire. This species is considered to regenerate well after fires. It was also collected at Hothfield in 1947 by Francis Rose (conf. A. Thompson, **BBSUK**) and he last saw it there in 1994. There were only two sites for it in Kent and if it is no longer at Hothfield then it is possibly extinct in the county.

Sphagnum auriculatum Schimp., Cow-horn Bog-moss: thriving in the middle part of bog 3. This is an important part of the hummock and lawn structure of the mire and is dependent on the more acidic water.

The species has now been split into two:
S. inundatum Russow (Lesser Cow-horn Bog-moss) and *S. denticulatum* (Cow-horn Bog-moss).
S. inundatum is the rarer of the two and requires more base-rich conditions in fens and the margins of bogs. *S. denticulatum*, however, is more widespread in Kent and is not uncommon on the more acid soils. The only confirmed record we have is of *denticulatum*, collected in 1936 by J.P.M. Brenan (NMW), although in 2009 J.I. Hendey recorded *inundatum*.

†*Sphagnum tenellum* (Brid.) Bory, Soft Bog-moss: reported by Francis Rose in 1948, but not seen since. It is strongly associated with very acid habitats, growing on hummocks. Hothfield was its only recorded site in Kent.

[*Sphagnum cuspidatum* Ehrh. ex Hoffm., Feathery Bog-moss: recorded by J.P.M. Brenan in 1936 (**BBSUK**) and more recently by J.G. Duckett *et al.* in 2002. This species is typically found submerged in bog pools and is a good indicator of the more acid, ombrotrophic conditions.]

Sphagnum fallax (H. Klinggr.) H. Klinggr., Flat-topped Bog-moss: abundant in bogs 2, 3 and 4, mostly forming lawns in wet parts of the bog. It is perhaps the most important plant for the formation of the mire, because it acidifies the water and creates the substrate on which the more specialised bog plants can grow. It is known in only a few sites in East Kent. *S. flexuosum* Dozy & Molk., Flexuous Bog-moss, is very similar to *S. fallax* and they have often been regarded as the same species (*S. recurvum* P. Beauv.). It was collected by Francis Rose in 1947 (NMW).

Polytrichastrum formosum (Hedw.) G.L. Sm., Bank Haircap: in woodland on the banks of the stream (TQ965457).This is one of three rather similar species which are useful indicators of the three main habitats at Hothfield.

Polytrichum commune Hedw., Silkwood: occasional to frequent in all the bogs. This species is an important component of bogs and is usually replaced by *P. formosum* in wet woodland, so the distribution of the two could be useful in monitoring the state of the bogs. *Polytrichum commune* has a four-sided capsule with a narrow neck.

Polytrichum juniperinum Hedw., Juniper Haircap: a characteristic species of the U1 *Rumex acetosella* grassland; abundant on the slope up Froghole Toll, below the football field. It is considered to be a good coloniser of bare ground and could be a useful indicator for monitoring the extent of good quality grassland, as it disappears quickly under bracken or scrub.

†*Rhodobryum roseum* (Hedw.) Limpr., Rose-moss, was recorded by W.R. Jeffrey in 1904. It is a plant of sandy grassland, often on anthills. It has not been recorded in Kent for many years, but its former presence at Hothfield shows that there was good quality grassland.

Mnium hornum Hedw., Swan's-neck Thyme-moss: occasional in wooded areas. This is one of the most common of woodland mosses, often found around the base of trees or on wooded banks. It is a useful indicator of shady habitats, so it is characteristic of mature woodland.

Aulacomnium palustre (Hedw.) Schwaegr., Bog Groove-moss: described by Hendey in 2012 as being present in all the bogs; it is certainly frequent in bogs 2, 3 & 4. This species is often associated with *Sphagnum* and is a good peat bog indicator, not being too rare or specialised in its habitat.

Vascular Plants

†*Lycopodiella inundata* (L.) Holub, Marsh Clubmoss: a scarce clubmoss which was found by G.E. Smith in about 1832 and subsequently collected by J.F. Jeffrey in 1884 (**BM**, **K**). In 1947 Francis Rose reintroduced it but his plants had died out by 1954. This is an axiophyte of wet heaths which is long gone from Kent, but it is still widespread in the New Forest and other southern heathlands. Its habitat is seasonally inundated, poached, peaty soils.

†*Lycopodium clavatum* L., Stag's-horn Clubmoss: recorded by W.R. Jeffrey in the 19th century and subsequently refound by Francis Rose and Peter Wilberforce in 1960, but it does not seem to have been seen since then. An axiophyte of heathland.

Equisetum fluviatile L., Water Horsetail: an axiophyte of clean water, abundant in bog 4.

Equisetum arvense L., Field Horsetail: around bog 4 and in the woodland below bog 2.

Pteridium aquilinum (L.) Kuhn, Bracken: occasional to abundant on dry ground throughout. This was the subject of much discussion in the 1975 symposium, where it was agreed that the spread of bracken was the biggest threat to the site. Some parts of the site are now dominated by this species, but others seem relative unaffected.

Athyrium filix-femina (L.) Roth, Lady Fern: there are a few plants in the triangle area, and many in the New Fen, on the other side of the A20. In the main part of the site it only occurs only along the western edge, in the pond at Butler's Toll (TQ969464) and down the boundary stream. It grows in places where there is lateral movement of ground water, and it is considered an axiophyte of damp woodland.

Dryopteris filix-mas (L.) Schott, Common Male Fern: frequent in the woodland areas, especially in the triangle and around the New Fen. A curious form, with forward-pointing pinnules, occurs in the New Fen area (TQ976456). Such forms were once collected for their ornamental value.

Dryopteris affinis (Lowe) Fraser-Jenk., Scaly Male-fern: rare, in woodland below bog 3 and in the New Fen. This is an indicator of ancient woodland.

Dryopteris carthusiana (Vill.) H.P. Fuchs, Narrow Buckler-fern: an axiophyte of peaty soils. It is occasional throughout and frequent in the bogs. The hybrid *Dryopteris* ˣ*deweveri* (J.T. Jansen) Wacht. (*carthusiana* x *dilatata*) is quite frequent in bog 4, with both parents (TR966460, Lockton, 2018).

Dryopteris carthusiana

Dryopteris ˣdeweveri

Dryopteris dilatata (Hoffm.) A. Gray, Broad Buckler-fern: occasional on the drier ground and in woodland; it also occurs on tussocks and tree stumps in bog 4.

Pseudotsuga menziesii (Mirbel) Franco, Douglas Fir: one fine specimen in the car park and another on Butler's Toll (TQ970462).

Pinus sylvestris L., Scots Pine: a clump of about twelve trees at Foxenhill Toll (TQ970456) and some more on Butler's Toll (TQ970463) which have evidently been there for many years, although there is no sign of them spreading.

Pinus nigra Arnold, Austrian Pine: two large trees, in woodland west of the car park, TQ970458, and on Butler's Toll (TQ970463).

Taxus baccata L., Yew: there is a sizeable tree in the New Fen and a few saplings elsewhere, notably in woodland by the stream.

Sequoiadendron giganteum (Lindl.) Buchholz, Wellingtonia: two enormous trees in the triangle area and two more on Foxenhill Toll.

Ceratocapnos claviculata (L.) Liden, Climbing Corydalis: in heathland near Bog 4; an axiophyte of dry heathland, open woodland or acid grassland. Philp (1975) described it as being 'quite common in the north-western portion of the reserve,' which is the area around Bog 4.

Mahonia aquifolium (Pursh) Nutt., Oregon Grape: well established in the woodland edge by Watery Lane (TQ975456).

Caltha palustris L., Marsh Marigold: a few plants by the stream on the western edge of the reserve. This is an axiophyte of wet woodland and alder carr.

Anemone nemorosa L., Wood Anemone: occasional in the woodland along the western edge of the site. This is an axiophyte of ancient woodland.

Clematis vitalba L., Traveller's Joy: in roadside hedges, grassland and scrub.

Ranunculus acris L., Meadow Buttercup: occasional in damp grassland and in bog 4.

Ranunculus repens L., Creeping Buttercup: occasional throughout.

Ranunculus bulbosus L., Bulbous Buttercup: in the sward on the old football pitch, in sandy grassland by bog 1 and even in woodland above bog 2.

Ranunculus sceleratus L., Celery-leaved Buttercup: occasional in bog 4 (TQ966461).

Ranunculus flammula L., Lesser Spearwort: frequent in all the bogs and pools. This is a wetland axiophyte, typical of neutral to acid woodland and swamp.

Ranunculus tripartitus DC., Three-lobed Crowfoot: a Nationally Rare plant of pools and muddy hollows in heathlands in southern and western Britain. Although it was discovered at Hothfield in 1994, it may have been known here (mistakenly identified as *Ranunculus hederaceus*, Ivy-leaved Crowfoot) since 1875 (F.M. Webb). It is typical of hollows in rutted tracks, but at present it occurs in bogs 2 and 3 at Hothfield, where it is likely that grazing and scrub clearance work create the disturbance that it requires.

Ficaria verna Huds., Lesser Celandine: frequent in damp woodland along the stream and scattered in the woodland elsewhere. Most plants are ssp. *fertilis* (Lawalrée ex Laegaard) Stace but along School Lane there are clumps of ssp. *verna* with bulbils developing in the leaf-axils.

Ribes rubrum L., Red Currant: occasional in the dry woodland.

Ribes uva-crispa L., Gooseberry: several patches in the woodland above bog 3, on Butler's Toll and in the New Fen.

Chrysosplenium oppositifolium L., Opposite-leaved Golden-saxifrage: numerous patches along the stream at the western edge of the reserve, TQ965457.

Crassula helmsii (Kirk) Cockayne, New Zealand Pigmyweed: abundant in the top part of bog 4, where it has been recorded since about 2006 (E.G. Philp). There are two patches of black plastic laid over part of this bog, to suppress it, but this has not been successful.

Lotus corniculatus L., Common Bird's-foot-trefoil: in grassland throughout.

Lotus pedunculatus Cav., Large Bird's-foot-trefoil: in all four bogs and the New Fen.

Ornithopus perpusillus L., Bird's-foot: frequent in the short acid grassland in the area of the football pitch and the Froghole Slope. This is an axiophyte of U1 *Rumex acetosella* grassland.

Vicia sepium L., Bush Vetch: surprisingly rare. I have only seen it at the far end of the New Fen.

Vicia sativa L., Common Vetch: occasional throughout. Two subspecies have been recorded: *V. sativa* ssp. *nigra* (L.) Ehrh., Narrow-leaved Vetch, is the native plant of acid grassland which occurs in the football pitch and adjacent areas; *V. sativa* L. ssp. *segetalis* (Thuill.) Gaudin, Common Vetch, which was in the past often used agriculturally, is more widespread and is found along paths and in the margins of the bogs.

Lathyrus pratensis L., Meadow Vetchling: a common grassland plant, found in tall grass and in bog 4.

Medicago arabica (L.) Huds., Spotted Medick: in short grassland, mainly along paths and disturbed areas, but also on anthills in the football field.

Trifolium ornithopodioides L., Bird's-foot Clover: this is an axiophyte of short, sandy grassland, usually near the sea. It has been recorded at Hothfield since Philp's first Atlas (1970s) and is still present. It occurs in the trampled sward of the main path near the woodland edge (TQ970457), but not in the football pitch.

Trifolium repens L., White Clover: occasional throughout.

Trifolium glomeratum L., Clustered Clover: an axiophyte of short, sandy grassland. It has been known at Hothfield since about 1832 (G.E. Smith) and was still present on the football field in 2019 (TQ970460), where it was recently re-found by Lucy Carden after twenty years with no records. There was only one small patch, which has not reappeared subsequently.

Trifolium suffocatum L., Suffocated Clover: found by Sue Buckingham in September 2011 on the western

edge of the football pitch, TQ97024610. The only other record was by E.G. Philp in 2002, possibly in the same place. It is an axiophyte of short, summer-parched grassland on the coast, with only a very few inland stations. Although it is generally considered a spring ephemeral, it is interesting to note the date of Buckingham's record.

Trifolium dubium Sibth., Lesser Trefoil: occasional throughout, especially on the old football field.

Trifolium micranthum Viv., Slender Trefoil: frequent in the short grassland on the football field and elsewhere. Although this is not considered an axiophyte, it is typical of the more species-rich parts of the dry grassland and would be a useful indicator of good condition.

Trifolium pratense L., Red Clover: rare. I have only seen it on the margins of bog 4, although it has been recorded since 1975 (Philp).

Trifolium subterraneum L., Subterranean Clover: in short grassland on the old football pitch. This is another axiophyte of short, sandy grassland; known here since the 19th century.

†*Genista anglica* L., Petty Whin: a very rare heathland axiophyte, with just a couple of sites in Kent. It was recorded at Hothfield in the late 19th century by W.R. Jeffrey and found again by the Kent Field Club in 1958 or 1959, but I don't think it has been seen since then.

Ulex europaeus L., Gorse: widespread throughout.

Ulex gallii Planch., Western Gorse: one shrub on the main slope near bog 2 (TQ96704571). It is intermediate in size between the other two gorses, with medium-sized spines, but the best way to identify it is by the size of the bracteoles (illustrated below). This is best considered an axiophyte of heathland in Kent, although it is very common in western parts of Britain.

Ulex minor Roth, Dwarf Gorse: considered an axiophyte of heathland, this species is very rare in Kent. At Hothfield Heath it is deliberately conserved from scrub clearance and there are some good-sized patches. It is, however, much less abundant than common gorse. *Ulex minor* has been recorded here since 1829 (G.E. Smith).

Polygala serpyllifolia Hose, Heath Milkwort: occasional in damper areas of heathland around the bogs; an axiophyte of heaths.

Prunus spinosa L., Blackthorn: occasional in woodland and scrub, mainly along the hedge on the western boundary.

Prunus avium (L.) L., Wild Cherry: several trees in woodland in the triangle area, TQ973457.

Prunus serotina Ehrh., Rum Cherry: one large shrub by a path at Froghole Toll (TQ970460), and a few saplings in woodland at the top of bog 3. This plant has distinctive orange-brown hairs along the proximal half of the main vein on the lower side of the leaves.

Prunus laurocerasus L., Cherry Laurel: rare, self-sown saplings in woodland near the road (TQ971459) and along the stream. There is also a row of them planted along School Road at TQ972455, but these are not within the reserve.

Malus domestica Borkh., Apple: a few trees on the woodland edge near the car park.

Sorbus aucuparia L., Rowan: in dry woodland near bog 4 and on Butler's Toll. It is rather curious that this species, which seems to be a natural for this site, was not recorded here until 2005 (E.G. Philp), but it is a species that has spread in recent decades as planting on roadsides and in gardens has led to its wider dispersal by birds. This is possibly how it arrived at Hothfield, and we might expect it to thrive.

Crataegus monogyna Jacq., Hawthorn: occasional in the woodland and scrub throughout. One shrub in the woodland at Froghole Toll (TQ970460) appears to be the hybrid *Crataegus* ˣ*media* (*monogyna* x *laevigata*), to judge by the leaf shape, although all the fruits seem to have only one style.

Rubus idaeus L., Raspberry: a few straggling plants by the path through woodland at Froghole Toll (TQ970460); recorded here since 1829 (G.E. Smith).

Rubus fruticosus agg., Bramble: occasional to abundant throughout. The variety *R. laciniatus*, Cut-leaved Bramble, which is an introduced cultivar, has been recorded in heathland on the main slope.

Potentilla anserina L., Silverweed: in wet grassland in bog 4 and elsewhere.

Potentilla erecta (L.) Raeusch., Tormentil: frequent throughout, in wet and dry heath and dry grassland. This is considered an axiophyte in Kent and is one of the most characteristic species of the site.

Potentilla reptans L., Creeping Cinquefoil: occasional in grassland and by paths.

Potentilla sterilis (L.) Garcke, Barren Strawberry: occasional in the triangle area.

Fragaria vesca L., Wild Strawberry: abundant along woodland paths in the triangle area (TQ973457).

Geum urbanum L., Wood Avens: occasional in woodland throughout, and even in bog 4.

Aphanes australis Rydb., Slender Parsley-piert: abundant in the acid grassland on the football pitch and in short grassland along paths. It is a spring ephemeral typical of this habitat.

Rosa arvensis Hudson, Field Rose: in woodland around bog 4 and in the triangle area.

Rosa canina L., Dog Rose: occasional in scrub and woodland throughout.

Frangula alnus Mill., Alder Buckthorn: in the damp woodland at the western end of the site (TQ965458), where it has been recorded since the 19th century (E.S. Marshall). This is considered an axiophyte of acid, peaty woodland.

Rhamnus cathartica L., Buckthorn: one shrub in the woodland below bog 4 (TQ96624611).

Ulmus procera Salisb., English Elm: there are patches of regrowth in the woodland below bog 2, and the remains of hedges along several of the roads.

Ulmus minor Mill., Small-leaved Elm: some sizeable trees on the edge of the woodland in the triangle area, and a couple of shrubs by the boundary stream, TQ96564557.

Urtica dioica L., Stinging Nettle: occasional throughout.

Fagus sylvatica L., Beech: a few trees in the woodland.

Castanea sativa Mill., Sweet Chestnut: occasional in the woodland. Most of the trees are mature standards, and therefore have less of a negative impact on the ground flora than the dense chestnut coppice that can be seen in many places throughout Kent.

Quercus cerris L., Turkey Oak: occasional in the woodland and scrub. Turkey Oak is a non-native species and is the vector for the Oak Knopper Gall, which reduces the fertility of the native oaks – a factor which could be advantageous here.

Quercus robur L., Pedunculate Oak: the dominant canopy tree in the woods, which are W10 *Q. robur* woodland, and scattered saplings in the scrub.

Myrica gale L., Bog Myrtle: one patch in bog 2, where it is protected from grazing by a wooden fence. It was first found here in 2010 and is apparently the only population in the county. It is believed to have been planted here, along with pitcher plant, *Sarracenia purpurea*, at about that time. The pitcher plants were quickly removed. Bog Myrtle can be a troublesome shrub on some bogs but at Hothfield that does not seem to be the case.

Betula pendula Roth, Silver Birch: occasional in the scrub.

Betula pubescens Ehrh., Downy Birch: occasional in the bogs and the scrub. This species might be expected to be more frequent in the bogs, and *B. pendula* more in the grassland, but they seem fairly evenly mixed, in fact.

Alnus glutinosa (L.) Gaertn., Alder: in wet areas along the western edge of the reserve, in bog 4 and along the stream below; less common in the other bogs. Some of the trees close to the western edge of the reserve are the hybrid with Italian Alder, *Alnus* ˣ*elliptica* Req. (conf. A.C. Leslie, CGE), which has not otherwise been recorded in Kent.

Alnus cordata (Lois.) Duby, Italian Alder: there are two tall hedges of Italian Alder along field margins in the extension to the reserve, to the west. These trees have given rise to many saplings on the edge of the reserve and along the stream.

Carpinus betulus L., Hornbeam: rare in the woodland. I have only noticed one tree, in the woodland below bog 3 (TQ96544582).

Corylus avellana L., Hazel: rare, around bog 4 and in the woodland around the northern part of the reserve, where there are scattered coppices.

Bryonia dioica Jacq., White Bryony: occasional in the woodland near the road.

Mercurialis perennis L., Dog's Mercury: in woodland in the triangle area and on Foxenhill Knoll.

Populus alba L., White Poplar: suckering prolifically near the fenceline at the end of the New Fen, TQ978456.

Populus tremula L., Aspen: locally abundant in areas of scrub, where it suckers freely and regenerates strongly after cutting. It is considered a woodland axiophyte in Kent.

Salix ˣ*fragilis* L., Crack-willow: one large tree at the end of the New Fen, TQ977456.

Salix caprea L., Goat Willow: a rather curious distribution, around the western margin of the heath, from the road at the south to the northernmost tip. Some of the trees are quite sizeable, notably at TQ966454. There are also a few trees on the edges of the New Fen and in the triangle area. The hybrid with grey willow, *Salix* ˣ*reichardtii* A. Kern., can be found in bog 4.

Salix atrocinerea Brot., Grey Willow: frequent in all the bogs and in the woodland along the stream.

Salix aurita L., Eared Willow: recorded by E.S. Marshall in the 19th century, and possibly still present in bogs 3 & 4. There are only a few small plants, which I think are better described as *S.* x*multinervis* Doll (*atrocinerea* x *aurita*). It is likely that pure *S. aurita* was once present but has been replaced by hybrids over time.

Viola odorata L., Sweet Violet: occasional in woodland and on mown road verges.

Viola riviniana Reichb., Common Dog-violet: in grassland on the old football pitch and in woodland near bog 4 and in the triangle area.

Viola reichenbachiana Jordan ex Boreau, Early Dog-violet: a couple of patches in woodland opposite the car park, TQ971459. This is an axiophyte of slightly calcareous woodland. The plants have the characteristic flower colour and leaf shape of *reichenbachiana*, but a slight notch on the spur, so they may be worth further study.

†*Viola canina* L., Heath Dog-violet: recorded by F.M. Webb in about 1880, but there are no records of it since then. It would probably have occurred in the grass-heath, but it would not have been able to tolerate the shade when the site scrubbed over in the 20th century.

Viola palustris L., Marsh Violet: occasional in bogs 1, 2 & 3. This in a rare axiophyte of bogs which has been known here since the 19th century (W.R. Jeffrey).

Viola x*wittrockiana* Gams ex Kappert, Garden Pansy: one plant, self-sown and rather similar to the wild type (*V. tricolor*), in the grassland above bog 4 (I. Rickards, 2021).

†*Linum radiola* L., Allseed: collected by H. Lamb in 1902 (MNE) and listed by Russell (1902); an axiophyte of sandy, acid grassland.

Hypericum androsaemum L., Tutsan: occasional clumps in the woodland and the bogs (for example, by the boardwalk through bog 2). This is normally a woodland plant; quite why it grows in the bogs is a bit of a mystery.

Hypericum perforatum L., Perforate St John's-wort: locally abundant in long grass around the football field and in wet parts of the New Fen.

Hypericum tetrapterum Fries, Square-stalked St John's-wort: occasional in acid grassland and bogs.

[*Hypericum humifusum* L., Trailing St John's-wort: listed by F. Rose (undated, ca. 1950) and by various people since then (but not by Philp, 1975). This is a heathland axiophyte.]

[*Hypericum pulchrum* L., Slender St John's-wort: listed by F. Rose (undated) and J. Pitt (1995); an axiophyte of heathy woodland.]

Hypericum elodes L., Marsh St John's-wort: thriving in bogs 2, 3 & 4. It is an axiophyte of acid flushes and the margins of peat bogs.

Geranium x*oxonianum* Yeo, Druce's Crane's-bill: a spectacular display around the car park, where it presumably originated as a garden throw-out.

Geranium rotundifolium L., Round-leaved Crane's-bill: scattered plants around the car park.

Geranium dissectum L., Cut-leaved Crane's-bill: occasional on disturbed ground and path sides.

Geranium pyrenaicum Burm. f., Hedgerow Crane's-bill: several plants by the roadside near the car park.

Geranium pusillum L., Small-flowered Crane's-bill: occasional in short grassland on the football pitch.

Geranium molle L., Dove's-foot Crane's-bill: frequent in short dry grassland throughout.

Geranium robertianum L., Herb-robert: in woodland and woodland margins.

Erodium maritimum (L.) L'Her., Sea Stork's-bill: a few plants on a sandy bank that was created when the old car park was closed in 2013 (TQ97064600). It was first spotted here by Heather Silk in 2017 and was still present in 2021. Although this plant does occur in dry, sandy grassland inland, it appears to be more of a casual at Hothfield, possibly having been brought in on car tyres.

Erodium cicutarium (L.) L'Her., Common Stork's-bill: occasional in short grassland on the football pitch and in the vicinity. The flower colour varies widely – usually bright pink on the football field, but almost white on bare ground in the old car park.

Lythrum portula (L.) D. Webb, Water Purslane: in bogs 2 & 4 and in some ephemeral pools along the track between them. It is an axiophyte of acid wet grassland and pool margins.

Epilobium hirsutum L., Great Willowherb: occasional in wet areas and road verges.

Epilobium parviflorum Schreb., Hoary Willowherb: occasional in wet areas such as bog 4.

Epilobium montanum L., Broad-leaved Willowherb: frequent in the woodland and in bog 4.

Epilobium obscurum Schreb., Short-fruited Willowherb: abundant in bog 4; occasional in the other bogs. The hybrid *E. obscurum* x *palustre* was also found by E.S. Marshall in the 19th century.

Epilobium ciliatum Raf., American Willowherb: abundant in bog 4 and occasional on disturbed ground.

Epilobium palustre L., Marsh Willowherb: occasional in the bogs, particularly 2 & 4. This is an axiophyte of nutrient-poor wetlands.

Chamaenerion angustifolium (L.) Holub, Rosebay Willowherb: frequent throughout, in woodland and tall herb.

Circaea lutetiana L., Enchanter's-nightshade: frequent in the dry woodland and on the wooded margins of bog 4.

Aesculus hippocastanum L., Horse-chestnut: several large trees in the triangle area, and scattered seedlings elsewhere.

Acer campestre L., Field Maple: one sapling, probably planted, on the edge of the car park. This species has been recorded since 1995 (J. Pitt) and could be in other places as well.

Acer pseudoplatanus L., Sycamore: occasional in the woodland, with saplings throughout.

Malva sylvestris L., Common Mallow: on the roadside near the car park.

Capsella bursa-pastoris (L.) Medik., Shepherd's-purse: there are tiny plants in the short grassland on the football field, looking like a natural component of the U1 community (it is usually considered an archaeophyte of arable fields). Records of it elsewhere around the site may be of ruderal plants on road verges. This is a very variable plant which is sometimes divided into numerous microspecies.

Cardamine pratensis L., Cuckoo-flower: occasional in wet areas, particularly Bog 4.

Cardamine flexuosa With., Wavy Bitter-cress: in bog 4 and areas of wet woodland.

Cardamine hirsuta L., Hairy Bitter-cress: occasional on bare ground.

†*Lepidium campestre* (L.) W.T. Aiton, Field Pepperwort: collected by J.E. Lousley in 1952 (**SLBI**). This is considered an axiophyte of arable fields and bare, sandy soils.

Lepidium draba L., Hoary Cress: occasional on road verges, but not seen within the reserve.

Erophila verna (L.) DC., Common Whitlowgrass: occasional in short grassland.

Sisymbrium officinale (L.) Scop., Hedge Mustard: on the roadside and around the car park.

Alliaria petiolata (M. Bieb.) Cavara & Grande, Garlic Mustard: occasional on the roadside and in the woodland edges.

Hesperis matronalis L., Dame's Violet: a patch in woodland near the track past bog 1; a garden escape.

Persicaria maculosa Gray, Redshank: some patches on the drier ground around bog 4.

Persicaria hydropiper (L.) Spach, Water-pepper: in wet grassland at bogs 2 and 4, and on the edges of the New Fen.

Polygonum arenastrum Boreau, Equal-leaved Knotgrass: occasional along paths.

Polygonum aviculare L., Knotgrass: on paths and disturbed ground. Recorded here since the 19th century (as *P. aviculare* var. *microspermum*, E.S. Marshall (**SLBI**)).

Rumex acetosella L., Sheep's Sorrel: abundant throughout. This is the most characteristic species of U1 *R. acetosella* grassland which occurs on the dry, sandy soil and makes up perhaps the largest area of habitat.

Rumex acetosa L., Common Sorrel: occasional in grassland and scrub, and extending into bog 4, where the plants grow exceptionally large.

Rumex crispus L., Curled Dock: occasional on disturbed ground.

Rumex conglomeratus Murray, Clustered Dock: rather rare – I have only seen it towards the lower end of bog 4, in marshy ground. This species is typical of wet habitats such as damp grassland and riverbanks.

Rumex sanguineus L., Wood Dock: frequent in the woodland and wetland areas such as bog 4 and the New Fen.

Rumex obtusifolius L., Broad-leaved Dock: occasional.

Drosera rotundifolia L., Round-leaved Sundew: thriving in bogs 2 & 3, but seemingly absent from 1 & 4. An axiophyte of acid mires and wet heath.

Arenaria serpyllifolia L., Thyme-leaved Sandwort: occasional in dry grassland areas such as the football field.

Moehringia trinervia (L.) Clairv., Three-nerved Sandwort: occasional in the woodland.

Stellaria media (L.) Villars, Chickweed: occasional.

Stellaria pallida (Dumort.) Pire, Lesser Chickweed: occasional in the acid grassland.

Stellaria holostea L., Greater Stitchwort: frequent in woodland along the stream at the western boundary of the reserve; occasional in hedges elsewhere.

Stellaria graminea L., Lesser Stitchwort: occasional in grassland and margins of bogs.

Stellaria alsine Grimm, Bog Stitchwort: in bogs 2 (C. Osborne, 2013) and 4, and the New Fen; an axiophyte of acid wetland.

†*Cerastium arvense* L., Field Mouse-ear: recorded by Russell (1902) and Rose (1943). This is an axiophyte of sandy grassland.

Cerastium fontanum Baumg., Common Mouse-ear: occasional in dry grassland.

Cerastium glomeratum Thuill., Sticky Mouse-ear: occasional on bare ground throughout.

Cerastium semidecandrum L., Little Mouse-ear: occasional in sandy grassland.

†*Moenchia erecta* (L.) P. Gaertn., B. Mey. & Scherb., Upright Chickweed: listed by Russell (1902), and mapped in this area in both of Philp's Atlases, although there are no records of it which are definitely from the reserve.

Sagina procumbens L., Procumbent Pearlwort: occasional in grassland and bogs.

[*Sagina apetala* Ard., Annual Pearlwort: recorded by F.M. Webb in the 19th century and by G.H. Morgan in 1957; also mapped for this area by Philp in the 1970s and recorded by J. Pitt in 2007, on the football field. More recently, *Sagina filicaulis* Jord., Slender Pearlwort, has been recorded by Geoffrey Kitchener in 2010. Until recently this was considered a subspecies of *S. apetala* (ssp. *erecta* F. Herm.). It is not apparent which species the earlier records refer to. *Sagina filicaulis* is considered to be a plant of man-made habitats, whereas *S. apetala* is from heaths and sandy grassland.]

†*Scleranthus annuus* L., Annual Knawel: recorded by F.M. Webb in the 19th century and still there is 1945 (E. Scott & F. Rose, **MNE**). This is an axiophyte of acid grassland.

†*Spergula arvensis* L., Corn Spurrey: recorded by E.S. Marshall in the 19th century. This is an axiophyte of arable fields and disturbed ground.

Spergularia rubra (L.) J.S. & C. Presl, Sand Spurrey: occasional in short grassland in and near the football pitch; first recorded here by F.M. Webb in the 19th century. This is an axiophyte of sandy, acid soils.

Silene dioica (L.) Clairv., Red Campion: occasional in woodland and scrub.

Silene flos-cuculi (L.) Clairv., Ragged Robin: abundant in the bogs; an axiophyte of wetland habitats.

Chenopodium hybridum L., Maple-leaved Goosefoot: rare, by the path from the car park where it crosses the road into the reserve, TQ971458. This appears to be new in 2019.

Chenopodium album L., Fat-hen: occasional on road verges and along paths, just occasionally spreading into the woodland.

Atriplex prostrata Boucher ex DC., Spear-leaved Orache: frequent along the roadsides.

Atriplex patula L., Common Orache: occasional along roadsides and paths.

Claytonia sibirica L., Pink Purslane: one patch on the western side of the reserve (TQ966460), seen by Sue Buckingham in 2012. It has been here since the 1990s (Philp, 2010).

Montia fontana L., Blinks: frequent in the U1 *Rumex acetosella* grassland on Froghole Slope between bog 4 and the football field (TQ969461), where it was also found by Francis Rose in 1963. It was also used recorded on a bank north of the main bog (B2, TQ968456) by H.M. Pratt in 1960. Philp (2010) considered all the Blinks in Kent to be var. *chondrosperma* (Fenzl) Walters.

Primula vulgaris Huds., Primrose: occasional scattered clumps in the woodland, most frequently perhaps in the woodland opposite the New Fen. There are also several patches of *Primula* cultivars which have been planted around the reserve.

†*Lysimachia minima* (L.) U. Manns & Anderb., Chaffweed: recorded by G.E. Smith in 1829. This is a heathland axiophyte.

Lysimachia tenella L., Bog Pimpernel: some good populations in several bogs, notably 2 and 4. This is an axiophyte of oligotrophic mires.

Lysimachia arvensis (L.) U. Manns & Anderb., Scarlet Pimpernel: a small patch on sandy ground by the gate into bog 1 (TQ969454) and an extensive area above bog 2, (TQ969457).

Calluna vulgaris (L.) Hull, Heather: frequent in bogs and damper areas of grassland; this is an axiophyte of mires and heaths.

Erica tetralix L., Cross-leaved Heath: mainly in the bogs, but also scattered in some of the drier heathland. An axiophyte, recorded here since the 19th century by F.M. Webb and Hanbury & Marshall.

†*Galium uliginosum* L., Fen Bedstraw: recorded here by E.S. Marshall in the 19th century. An axiophyte of base-rich fens with just a few sites in Kent.

Galium palustre L., Common Marsh-bedstraw: abundant in the bogs.

Galium album Mill., Hedge Bedstraw: occasional in tall grassland, for example by the football field.

Galium saxatile L., Heath Bedstraw: frequent throughout; known here since the 19th century (F.M. Webb). This is a heathland axiophyte.

Galium aparine L., Cleavers: occasional in grassland, woodland and wetland.

Centaurium erythraea Rafn., Common Centaury: in dry grassland around bog 4 and on a sandy bank above bog 1.

Vinca major L., Greater Periwinkle: small patches in woodland near the car park and by the path across bog 4.

Anchusa arvensis (L.) M. Bieb., Bugloss: many plants on a sandy bank above bog 2, TQ969457.

Pentaglottis sempervirens (L.) Tausch ex L. Bailey, Green Alkanet: a patch by the gateway near the road at TQ971457, probably originating as garden throw-outs, although it has been recorded here since 1975,

Myosotis secunda Al. Murray, Creeping Forget-me-not: abundant in bogs 2 & 4. This is considered an axiophyte of acid soils. It was first noticed here by Francis Rose in 1949 although it must always have been present; earlier recorders probably thought it was the much commoner *M. scorpioides*.

Myosotis arvensis (L.) Hill, Field Forget-me-not: around the edge of the football pitch, in long grass, and in dry grassland and open woodland throughout.

Myosotis discolor Pers., Changing Forget-me-not: in short grassland on the football pitch and nearby areas, in U1 *Rumex acetosella* grassland. Curiously, it also occurs on ant hills raised above the water level in bog 4.

Calystegia sepium (L.) R. Br., Hedge Bindweed: in the scrub in the middle of bog 4; recorded here since at least 1902 (Russell).

Calystegia silvatica (Kit.) Griseb., Large Bindweed: in the roadside hedge by the car park.

†*Cuscuta epithymum* (L.) L., Dodder: recorded by G.E. Smith in 1832; an axiophyte of heathland which is parasitic on heather, gorse, etc.

Solanum nigrum L., Black Nightshade: many plants on bare ground in the woodland opposite the car park, TQ971458. The plants are ssp. *nigrum*, a weed of disturbed ground.

Solanum dulcamara L., Bittersweet: in bog 4 and the New Fen.

Fraxinus excelsior L., Ash: occasional throughout. There are some large trees in the woodland areas and many seedlings and saplings on the woodland floor.

Syringa vulgaris L., Lilac: one planted shrub by the path at TQ96544559.

Digitalis purpurea L., Foxglove: occasional in dry grassland and woodland edges.

Veronica officinalis L., Heath Speedwell: in acid grassland around the football pitch and elsewhere; an axiophyte of heaths.

Veronica montana L., Wood Speedwell: occasional in woodland in the triangle area.

Veronica scutellata L., Marsh Speedwell: occasional in bog 4, in *Juncus* ˣ*surrejanus* rush-pasture and *Hypericum elodes* flushes; it has previously been recorded in the main bog (bog 2) by N.F. Stewart in 1998 and C. Osborne in 2012/13. An axiophyte of mesotrophic wetlands, it has been known here since the 19th century (W.R. Jeffrey and Hanbury & Marshall).

Veronica serpyllifolia L., Thyme-leaved Speedwell: occasional in grassland and along tracks.

Veronica hederifolia L., Ivy-leaved Speedwell: occasional in the woodland.

Veronica polita Fries, Grey Field-speedwell: rare in open grassland at TQ967460 (C. Turner, 2019); a weed of disturbed ground.

Veronica chamaedrys L., Germander Speedwell: occasional in longer grassland such as the margins of the football field.

Veronica arvensis L., Wall Speedwell: occasional in dry grassland.

Plantago coronopus L., Buck's-horn Plantain: occasional along paths in the vicinity of the football field and in sandy grassland by bog 1.

Plantago major L., Greater Plantain: occasional.

Plantago lanceolata L., Ribwort Plantain: occasional.

Callitriche stagnalis Scop., Common Water-starwort: in pools at the lower end of bog 4 and in bogs 1 & 2 (det. R.V. Lansdown). It also occurs in the pond at Butler's Toll (TQ969464).

[*Callitriche brutia* Petagna, Intermediate Water-starwort, was recorded by N.F. Stewart in bog 2 in 1998.]

†*Verbascum blattaria* L., Moth Mullein: recorded on 'Hothfield Common' by W.R. Jeffrey in the 19th century.

Scrophularia nodosa L., Common Figwort: occasional in woodland, grassland and scrub.

Scrophularia auriculata L., Water Figwort: at the top of bog 2, in bog 4, along the stream and in the New Fen.

Buddleja davidii Franch., Butterfly-bush: several bushes by the path past the football field, TQ970460.

Stachys sylvatica L., Hedge Woundwort: occasional.

Lamium album L., White Dead-nettle: frequent along the roadside and in the woodland edge.

Galeopsis bifida Boenn., Bifid Hemp-nettle: a sizeable patch in the woodland edge at the top of the main bog (TR970456).

†*Marrubium vulgare* L., White Horehound: recorded by F.M. Webb in the 19th century. Although this is a Nationally Scarce native plant of sandy grassland, Hanbury & Marshall (1899) considered the plants in Kent to be escapes from cultivation.

Scutellaria minor Huds., Lesser Skullcap: in bogs 2, 3 & 4, and possibly elsewhere; known here since the 19th century (F.M. Webb and Hanbury & Marshall). This is an axiophyte of marshes and wet woodland.

Teucrium scorodonia L., Wood Sage: occasional in dry grassland and heath.

Ajuga reptans L., Bugle: in dry woodland at the New Fen, TQ976456.

Glechoma hederacea L., Ground-ivy: occasional throughout; sometimes abundant.

Prunella vulgaris L., Selfheal: occasional.

†*Thymus pulegioides* L., Large Thyme: recorded by F.M. Webb and Hanbury & Marshall in the 19th century, and listed by Russell (1902), possibly repeating the previous records.

Lycopus europaeus L., Gipsywort: occasional in bog 4 and abundant in the New Fen.

Mentha aquatica L., Water Mint: frequent in the bogs and wet areas.

†*Mentha spicata* x *suaveolens* = *M.* ˣ*villosa* Huds., Apple-mint: recorded by R.A. Graham in 1948.

Erythranthe moschata (Douglas ex Lindl.) G.L. Nesom, Musk: by the spring at the top of the main bog (B2) in 2020 (TQ970456), where it was found by Sue Buckingham. This is a garden escape which has not been found in the wild in East Kent before, although it is well established in upland parts of Britain. It was probably planted here quite recently and it may not persist.

Pedicularis sylvatica L., Lousewort: widespread in the dry grassland and bogs; an axiophyte.

Verbena officinalis L., Vervain: in grassland near bog 4 and along woodland paths in the triangle area.

Ilex aquifolium L., Holly: occasional in the woodland throughout.

Campanula rotundifolia L., Harebell: rare, on a bank near bog 2 (TQ96844569, I. Rickards, 2013). It has been recorded here since at least 1902 (H.W. Russell). This species is an axiophyte of acid grassland.

Menyanthes trifoliata L., Bogbean: in the flush above bog 4; an axiophyte of oligotrophic wetlands and bog margins.

Arctium minus (Hill) Bernh., Lesser Burdock: occasional on the roadside and in the woodland.

Cirsium vulgare (Savi) Ten., Spear Thistle: occasional in grassland.

Cirsium palustre (L.) Scop., Marsh Thistle: common in the bogs and wet areas.

Cirsium arvense (L.) Scop., Creeping Thistle: occasional.

Lapsana communis L., Nipplewort: occasional in woodland and scrub.

Hypochaeris radicata L., Cat's-ear: occasional in the grassland.

†*Hypochaeris glabra* L., Smooth Cat's-ear: recorded by Francis Rose 'on a dry bank near Froghole Cottage, 1948-60.' It was considered by Philp to have been lost by 1975. This is an axiophyte of heathland which has declined throughout its range in recent decades.

Leontodon saxatilis Lam., Lesser Hawkbit: rare, in grassland. I have seen it alongside the concrete path at the bottom of the main bog (B2, TQ966456).

Sonchus arvensis L., Perennial Sow-thistle: in bog 4 and possibly elsewhere.

Sonchus oleraceus L., Smooth Sow-thistle: in bog 4 and on a sandy bank above bog 2; a weed of waste ground and roadsides.

Sonchus asper (L.) Hill, Prickly Sow-thistle: around bog 4 and possibly elsewhere; a weed of waste ground.

Mycelis muralis (L.) Dumort., Wall Lettuce: rare, on the hedgebank along the track beside bog 1 (TQ969454) and in woodland on Butler's Toll.

Taraxacum officinale Weber, Dandelion: occasional.

Crepis capillaris (L.) Wallr., Smooth Hawk's-beard: many plants along the side of the path alongside bog 4 (TQ966461).

Pilosella officinarum F. Schultz & Schultz-Bip., Mouse-ear-hawkweed: occasional in short grassland.

†*Filago minima* (Smith) Pers., Small Cudweed: recorded in the 19th century by W.R. Jeffrey and Hanbury & Marshall, and last seen by Francis Rose in 1945. An axiophyte of U1 *Rumex acetosella* grassland.

Gnaphalium uliginosum L., Marsh Cudweed: occasional on wet mud, and seasonally inundated hollows.

Pulicaria dysenterica (L.) Bernh., Common Fleabane: occasional in damp areas throughout.

Erigeron canadensis L., Canadian Fleabane: a few plants on a soil heap by the path to the football field.

Erigeron floribundus (Kunth) Sch. Bip., Bilbao's Fleabane: on a spoil heap and disturbed ground near the entrance, TQ970459.

Solidago gigantea Aiton, Early Goldenrod: a large patch on the edge of bog 4, where the path crosses (TQ96864623). This was first recorded by J. Shorter in 2000 and differs in having glabrous leaves and stems glabrous below the inflorescence.

Symphyotrichum ˣ*versicolor* (Willd.) G.L. Nelson, Late Michaelmas-daisy: rare, by the path across bog 4 (TQ968462, conf. G.D. Kitchener).

Bellis perennis L., Daisy: occasional.

Artemisia vulgaris L., Mugwort: on the roadside and by paths near the car park. This is a ruderal that is tolerant of light shade.

†*Achillea ptarmica* L., Sneezewort: recorded in the 19th century by W.R. Jeffrey and in 1960 by E. Scott; an axiophyte of mesotrophic wetlands.

Achillea millefolium L., Yarrow: occasional.

Matricaria discoidea DC., Pineapple Weed: occasional.

Senecio jacobaea L., Common Ragwort: occasional throughout, on bare ground, dry grassland, and even occasionally in wet places such as bog 4.

Senecio vulgaris L., Groundsel: listed by Philp (1975) and by various people since; a weed of disturbed soil.

†*Bidens cernua* L., Nodding Bur-marigold: found in the 19th century by F.M. Webb and Hanbury & Marshall; an axiophyte of mesotrophic wetlands.

Adoxa moschatellina L., Moschatel: small patches in woodland in the New Fen and by the path alongside bog 4. This is an axiophyte of damp woodland.

Sambucus nigra L., Elder: occasional.

Viburnum opulus L., Guelder-rose: rare, in the woodland around the New Fen.

Symphoricarpos albus (L.) S.F. Blake, Snowberry: along the road verge opposite the car park, just spreading into the woodland.

Lonicera periclymenum L., Honeysuckle: occasional in the scrub, reflecting the previous woodland cover over almost the whole of the site. It also occurs in bog 2, by the side of the boardwalk, in habitat where it would not normally be expected.

Succisa pratensis Moench, Devil's-bit Scabious: frequent in the bogs; an axiophyte of acid soils.

Hedera helix L., Ivy: frequent in the woodland.

Hydrocotyle vulgaris L., Marsh Pennywort: frequent in the bogs and the New Fen; an axiophyte of oligotrophic wetland.

Chaerophyllum temulum L., Rough Chervil: in long grassland on the roadside.

Anthriscus sylvestris (L.) Hoffm., Cow Parsley: frequent along roadsides.

Aegopodium podagraria L., Ground-elder: in grassland on verge and in woodland towards the SW corner of the reserve.

†*Oenanthe fistulosa* L., Tubular Water-dropwort: found in the 19th century by F.M. Webb and Hanbury & Marshall; an axiophyte of mesotrophic wetlands.

Oenanthe crocata L., Hemlock Water-dropwort: abundant along the stream at the western edge of the site (ca. TQ965459).

†*Helosciadium inundatum* (L.) W.D.J. Koch, Lesser Marshwort: recorded by W.R. Jeffrey in 1899. An axiophyte of oligotrophic wetland.

Helosciadium nodiflorum (L.) W.D.J. Koch, Fool's Watercress: occasional in wetland areas, including bog 4 and the New Fen, and in the stream on the western boundary.

Sison amomum L., Stone Parsley: on the verge of the track in the SW corner of the heath (TQ966454). This is not really in the reserve, although it is shown on the map as being within the common.

Angelica sylvestris L., Wild Angelica: in bog 4 and the New Fen.

Heracleum sphondylium L., Hogweed: occasional throughout.

Torilis japonica (Houtt.) DC., Upright Hedge-parsley: frequent in tall grassland around the car park and along the roadside, but also found in the reserve, for example in woodland edge below the main bog.

Daucus carota L., Wild Carrot: rare, just a couple of plants by the path across the bottom of bog 2 in 2020; possibly just a casual here. There are old records for the vicinity of Hothfield, but no localised records for the reserve.

Arum maculatum L., Lords-and-ladies: occasional in woodland and grassland throughout.

Arum italicum Mill., Italian Lords-and-ladies: several clumps on Foxenhill Toll (TQ970455).

Lemna minor L., Common Duckweed: occasional in ponds.

Lemna minuta Kunth, Least Duckweed: in the flush above and the pool below bog 4.

Alisma plantago-aquatica L., Water-plantain: rare, in bog 4.

Triglochin palustris L., Marsh Arrowgrass: very rare, in bog 4; possibly now lost from the site. I saw a single plant in 2018 but have been unable to find it again. This is an axiophyte of short, base-rich grassy swards in fens.

Potamogeton polygonifolius Pourr., Bog Pondweed: thriving in all the bogs. An axiophyte of acid mires.

†*Potamogeton coloratus* Hornem., Fen Pondweed: collected by G. Dowker in the 19th century but not recorded since. It is an axiophyte of base-rich fens and might be expected in bog 4 but not in the others.

Narthecium ossifragum (L.) Huds., Bog Asphodel: abundant in the main bog (B2). It is an axiophyte of mires, often favouring places where there is some lateral water movement, or bogs that are slightly drying out.

Tamus communis L., Black Bryony: on a dry wooded bank where the path crosses bog 4 (TQ968462) and along the verge of School Road.

Neottia ovata (L.) Bluff & Fingerh., Twayblade: found 'on a clay patch' in 1948 by Francis Rose. This is an axiophyte of calcareous woodland, not at all typical of the site. However, it is still there, in the triangle area at TQ973456 (I. Rickards, 2019).

Dactylorhiza maculata (L.) Soó, Heath Spotted-orchid: frequent in and around bog 2. This species is more restricted to bogs and acid grassland and is considered an axiophyte of these habitats.

Dactylorhiza ˣ*hallii* (Druce) Soó (*maculata* x *praetermissa*), Heath Spotted x Southern Marsh Orchid, is rare in bog 4 (TQ96744611, conf. R.M. Bateman, 2020). This hybrid, which is not uncommon, has been recorded here several times since Francis Rose first reported it in 1942, but it can be difficult to find amongst the swarm of rather variable Southern Marsh orchids.

Dactylorhiza praetermissa (Druce) Soó, Southern Marsh-orchid: abundant in bog 4 and rare in other bogs; it is typical of marshy grassland and fens.

Dactylorhiza praetermissa

Anacamptis pyramidalis (L.) Rich., Pyramidal Orchid: one plant on the edge of the reserve at TQ967454 (I. Rickards, 2019). It has been here a few years. This is an axiophyte of calcareous grassland.

†*Ophrys apifera* Huds., Bee Orchid: 'one plant on a clay patch' in 1944 (F. Rose).

Iris pseudacorus L., Yellow Iris: in bog 4 and along the stream; also in the New Fen

Iris foetidissima L., Stinking Iris: rare, but scattered throughout the wooded areas.

Crocosmia ˣ*crocosmiiflora* (Lemoine ex Burb. & Dean) Nicholson, Montbretia: in woodland west of the car park, TR970458, and in the New Fen. Probably introduced as garden waste originally, but now well established.

Allium ursinum L., Ramsons: a good-sized patch on the verge of the track above bog 1, TQ970454, in a wooded area.

Galanthus nivalis L., Snowdrop: planted in the New Fen, near a house.

Narcissus spp. L., Daffodils: frequent around the edges of the reserve, especially near to houses and the roadside, and occasional clumps scattered throughout, where people have planted them. Some of the plants are *Narcissus pseudonarcissus*, but others are cultivars.

Ornithogalum umbellatum L., Star-of-Bethlehem: in woodland close to the car park. It has been recorded here since 1948 (H.M. Pratt) and seems very persistent for a garden throw-out.

Hyacinthoides non-scripta (L.) Chouard ex Rothm., Bluebell: frequent in the woodland and scattered throughout the grassland. This is an axiophyte of ancient woods which spreads into new woodland only slowly, so its prevalence at this site shows the extent to which it must have had tree cover in the past.

Sparganium erectum L., Branched Bur-reed: in bog 4 and the New Fen.

Typha latifolia L., Great Reedmace: occasional in bogs 2 & 4 and the New Fen. The hybrid with *T. angustifolia*, Lesser Reedmace (*Typha* ˣ*glauca*), is frequent in the lower parts of Bog 4 (TQ960460). It has a short length of stem visible between the male and female sections of the spike and narrower leaves (8 mm wide in the specimen pictured below).

Typha x glauca

Juncus articulatus L., Jointed Rush: abundant in the lower part of bog 4 and in all the other bogs, where it can the most abundant species in what is presumably M23b rush-pasture, and it is also frequent in a variety of other communities. Many of the plants seem to have only partial fertility, and most of them have recurved tips to the outer tepals, which suggests that following hybrid is very common.

Juncus ˣ*surrejanus* Druce ex Stace & Lambinon (*articulatus* x *acutiflorus*): this hybrid appears to be common on Hothfield. Most of the plants that look like *J. acutiflorus* (in bogs 1 & 4 and the New Fen) are sterile, with capsules shorter than tepals, as described by Blackstock & Roberts (1986). Everywhere else, the plants that appear to be *J. articulatus* often have somewhat intermediate characters, such as outward-curving tepals and are often sterile or with only low seed set. It seems possible that many of the rushes at Hothfield are hybrids, and surveyors may find it difficult to put a name to the plants they find.

Juncus ˣ*surrejanus*

Juncus acutiflorus Ehrh. ex Hoffm., Sharp-flowered Rush: in the New Fen and the upper part of bog 4, although it never seems to set seed, and could be described as *J.* ˣ*surrejanus*. It was first recorded here by H. Lamb in 1900 (**MNE**). Sharp-flowered Rush is much rarer than Jointed Rush in Kent, and it occurs in more acid, low-nutrient conditions; it is therefore considered an axiophyte of acid grassland and bogs.

Juncus bulbosus L., Bulbous Rush: abundant in bogs 2, 3 & 4. This is an axiophyte of oligotrophic wetlands; here it tends to occur on patches of bare peat.

Juncus squarrosus L., Heath Rush: frequent in the grassland, especially along paths, near the acid bogs (1-3). It is scarcer in drier ground.

Juncus tenuis Willd., Slender Rush: frequent on woodland paths on Butler's Toll and occasional along heathland paths near bogs 2 and 4. This is an introduced species that always seems to grow along paths but doesn't tend to spread into semi-natural habitats.

Juncus bufonius L., Toad Rush: occasional throughout, especially in rutted tracks along paths.

Juncus inflexus L., Hard Rush: occasional throughout.

Juncus effusus L., Soft-rush: occasional throughout, mainly in the bogs but also in winter-wet spots in the grassland and woodland. Most of the plants have rather compact flower heads and many tiny ridges on the stems; these are *J. effusus* var. *subglomeratus*, and should not be confused with the following species, which has a dull green stem, fewer, more pronounced ridges, and a flattened bract (the top of the stem, above the inflorescence). *Juncus effusus* is a common wetland plant, typical of bogs and slightly acidic wetland.

Juncus conglomeratus L., Compact Rush: occasional in the New Fen. I have not seen this species in the main part of the site at all. Also recorded by Francis Rose in 1947 (**MNE**).

Luzula campestris (L.) DC., Field Wood-rush: abundant in the dry grassland.

Luzula multiflora (Ehrh.) Lej., Heath Wood-rush: frequent in the bogs and heath. This is an axiophyte of heathland. Francis Rose recorded both var. *congesta* (Thuill.) Arcang. and var. *multiflora* in the 1940s and 1950s.

Eriophorum angustifolium Honck., Common Cottongrass: locally abundant in the bogs; axiophyte.

Scirpus sylvaticus L., Wood Club-rush: a large patch in bog 4 (TQ967461); apparently not recorded before 2019. This is an axiophyte of base-rich fens and wetlands.

Eleocharis palustris (L.) Roem. & Schult., Common Spike-rush: locally abundant in bog 4.

Eleocharis multicaulis (Sm.) Desv., Many-stalked Spike-rush: a very rare axiophyte of peaty soils; locally abundant in bogs 2, 3 & 4. It has been known here since the 19th century (F.M. Webb and Hanbury & Marshall).

Isolepis setacea (L.) R. Br., Bristle Club-rush: occasional in bog 4. This is an axiophyte of marshy grassland, first recorded here by F.M. Webb in 1880.

Carex paniculata L., Greater Tussock-sedge: many fine plants in bog 4; a few on the edge of bog 2; and one large plant in the New Fen This is an axiophyte of fens and wet woodland.

†*Carex* ˣ*boenninghausiana* (*paniculata* x *remota*) was recorded in 1923 by Miss Cobbe. This is quite a common hybrid wherever the parents occur together, but it has not been seen recently despite several searches.

Carex divulsa Stokes, Grey Sedge: on dry ground near bog 4 (TQ966461) and in the New Fen, and along roadsides in various places.

Carex remota L., Remote Sedge: rare in bog 4 and frequent along the stream on the western boundary. Note that the hybrid with *C. paniculata* was found in 1923.

Carex leporina L., Oval Sedge: abundant in bogs 2 and 4 and in wet grassland; recorded here since the 19th century (F.M. Webb).

Carex echinata Murray, Star Sedge: abundant in the bogs; this is an axiophyte of mires and wet heath.

Carex hirta L., Hairy Sedge: occasional in damp grassland and extending into the fen at bog 4.

Carex pseudocyperus L., Cyperus Sedge: small patches in the New Fen and bog 4.

Carex rostrata Stokes, Bottle Sedge: some good-sized patches in bog 4, where it has been known since the 19th century (W.R. Jeffrey). An axiophyte of oligotrophic conditions and ombrotrophic bogs.

Carex pendula Hudson, Pendulous Sedge: abundant along the roadside near the car park. Within the reserve, there is a small amount in bog 4, where it is heavily grazed and therefore not abundant, and along the stream on the western boundary. There are also some plants in the New Fen. It is normally a plant of wet woodland rides and it can become very abundant if allowed to thrive.

Carex sylvatica Huds., Wood Sedge: rare, in woodland on the edge of the New Fen.

Carex panicea L., Carnation Sedge: abundant in the bogs and the New Fen; an axiophyte of acidic flushes and wet grassland which is very rare in Kent. The leaves are glaucous on both surfaces and have a trigonous tip, as illustrated below.

Carex laevigata Smith, Smooth-stalked Sedge: occasional throughout bog 4. It was first recorded here by E.S. Marshall in the 19th century. It is an axiophyte, normally of damp woodland on acid soils.

Carex binervis Smith, Green-ribbed Sedge: in grassland near bog 2 (TQ968457). This is an axiophyte of acid grassland and heath. It was first recorded here by Francis Rose in 1946.

Carex demissa Hornem., Common Yellow Sedge: frequent in all the bogs; an axiophyte of oligotrophic wetland. Known here since the 19th century (W.R. Jeffrey; Hanbury & Marshall).

Carex pilulifera L., Pill Sedge: frequent in the heathland and acid grassland; an axiophyte. Known here since the 19th century (W.R. Jeffrey; J.S. Mill).

Carex nigra (L.) Reichard, Common Sedge: in bogs 2 & 3 and in heathland around this area; an axiophyte of acid flushes and mires.

Carex pulicaris L., Flea Sedge: rare, in bogs 2 & 4. This is an axiophyte of mires; Hothfield is the only known site for it in Kent.

Nardus stricta L., Mat-grass: very rare. The only place where it has been seen recently in on the main slope, between bogs 2 and 3, and there may be as little as two or three clumps. It is an axiophyte of upland and acid grassland and was first recorded here by G.E. Smith in 1829.

Schedonorus arundinaceus (Schreb.) Dumort., Tall Fescue: along the road verge between the two main portions of the reserve.

Schedonorus giganteus (L.) Holub, Giant Fescue: in woodland in the triangle and on Foxenhill Toll.

Lolium perenne L., Perennial Rye-grass: occasional throughout.

Festuca rubra L., Red Fescue: occasional in grassland.

Festuca ovina L., Sheep's Fescue: occasional in dry grassland and on ant hills in bog 4. It is an axiophyte of dry grassland.

Festuca filiformis Pourr., Fine-leaved Sheep's-fescue: on dry, sandy soil on the main slope (S. Buckingham, 2021). An axiophyte of dry grassland.

Vulpia bromoides (L.) Gray, Squirrel-tail Fescue: abundant in dry grassland and along the boardwalk to bog 2.

Vulpia myuros (L.) C. Gmelin, Rat's-tail Fescue: locally abundant on a dry bank above bog 1, TQ969464 and around the football field.

†*Vulpia ciliata* Dumort., Bearded Fescue: recorded in the reserve by F. Rose before 1981 and listed for this area by Philp in both his atlases. It is a plant of maritime sand and shingle, also known in a few places inland on the Greensand. The plants are described as ssp. *ambigua* (Le Gall) Stace & Auquier, which is the native type.

Poa annua L., Annual Meadow-grass: occasional along track sides.

Poa trivialis L., Rough Meadow-grass: frequent throughout, in dry grassland and bogs.

Poa pratensis L., Smooth Meadow-grass: in grassland on the old football pitch and elsewhere.

Poa nemoralis L., Wood Meadow-grass: occasional in the woodland.

Dactylis glomerata L., Cock's-foot: occasional in tall grassland.

Arrhenatherum elatius (L.) P. Beauv., False Oat-grass: occasional throughout.

Deschampsia flexuosa (L.) Trin., Wavy Hair-grass: abundant in dry grassland; an axiophyte of acid grassland and heath or woodland.

Holcus lanatus L., Yorkshire-fog: frequent throughout, in grassland, scrub and bogs.

Holcus mollis L., Creeping Soft-grass: Frequent in dry acid grassland and extending into the wetland of bog 4.

†*Aira caryophyllea* L., Silver Hair-grass: recorded by F.M. Webb in the 19th century; an axiophyte of acid grassland.

Aira praecox L., Early Hair-grass: frequent in the acid grassland; an axiophyte.

Anthoxanthum odoratum L., Sweet Vernal Grass: frequent throughout, in both wet and dry habitats.

Phalaris arundinacea L., Reed Canary-grass: in bog 4.

Agrostis capillaris L., Common Bent: frequent in the drier areas of grassland.

Agrostis stolonifera L., Creeping Bent: frequent in wet grassland and the edges of bogs.

Agrostis canina L., Velvet Bent: locally abundant in the bogs.

Agrostis vinealis Schreb., Brown Bent: numerous closely-grazed clumps in heathland on the main slope (TQ969458, S. Buckingham, 2020).

Glyceria fluitans (L.) R. Br., Floating Sweet-grass: in the more mesotrophic wetland areas, such as the pools at the bottom of the bogs.

Glyceria notata Chevall., Plicate Sweet-grass: in bog 4 and the New Fen; also recorded by N.F. Stewart in 1998 in bog 2; an axiophyte of mesotrophic wetland.

Bromus hordeaceus L., Soft-brome: occasional in dry grassland.

Anisantha sterilis (L.) Nevski, Barren Brome: frequent in hedges and disturbed areas.

Brachypodium sylvaticum (Huds.) P. Beauv.: frequent along road verges in the triangle area and around New Fen.

Danthonia decumbens (L.) DC., Heath-grass: there are at least three patches: one on the south side of bog 2 (TQ968458), along the track from bog 3 to the main path (TQ96924574) and it is quite abundant along the main path (TQ96684584). It was first recorded here by F.M. Webb in about 1880; an axiophyte of acid grassland and heath.

Molinia caerulea (L.) Moench, Purple Moor-grass: abundant in the bogs and heathland; an axiophyte. Recorded here since the 19th century (W.R. Jeffrey; Hanbury & Marshall).

Vegetation Quadrats

Quadrat	Habitat	GR	Date	Comment
Q1199	M23a Juncus acutiflorus rush-pasture	TQ96924623	22 Jun 2019	Flush at the top of Bog 4.
Q1200	M29 Hypericum elodes soakway	TQ96974568	01 July 2019	Top of Bog 2.
Q1202	M21 Narthecium ossifragum valley mire	TQ96944568	01 July 2019	Middle of Bog 2.
Q1203	M21 Narthecium ossifragum valley mire	TQ96824565	01 July 2019	By the boardwalk in bog 2.
Q1204	U1 Rumex acetosella grassland	TQ97014577	01 July 2019	On the side of the main path.
Q1206	S3 Carex paniculata swamp	TQ96774618	11 July 2019	Tussock sedge swamp in bog 4.
Q1209	M29 Hypericum elodes soakway	TQ96734610	11 July 2019	Bog 4.
Q1220	W8 Fraxinus excelsior woodland	TQ97314578	3 September 2019	Woodland in the triangle area.
Q1222	U1 Rumex acetosella grassland	TQ96904615	22 March 2020	Short grassland above bog 4.
Q1232	W10 Quercus robur woodland	TQ96504578	22 APR 2020	Acid woodland near the stream.
Q1242	M9 Carex rostrata mire	TQ96884621	12 May 2020	Bogbean bog.
Q1263	M23a Juncus acutiflorus rush-pasture	TQ96744612	21 June 2020	Grazed Carex paniculata swamp.

	Q1199	Q1200	Q1202	Q1203	Q1204	Q1206	Q1209	Q1220	Q1222	Q1232	Q1242	Q1263
Acer pseudoplatanus	-	-	-	-	-	4	-	4	-	-	-	-
Agrostis capillaris	-	-	-	-	2	-	-	-	4	-	-	-
Agrostis stolonifera	-	2	-	-	-	-	-	-	-	-	2	-
Aira praecox	-	-	-	-	5	-	-	-	-	-	-	-
Lysimachia tenella	-	-	-	7	-	-	-	-	-	-	-	-
Anthoxanthum odoratum	2	-	-	-	-	-	-	-	-	-	-	-
Aphanes australis	-	-	-	-	3	-	-	-	4	-	-	-
Aulacomnium palustre	-	3	-	-	-	-	-	-	-	-	2	-
Betula pendula	-	-	-	-	-	-	-	4	-	4	2	-
Betula pubescens	-	4	1	1	-	-	-	-	-	9	-	-
Calliergonella cuspidata	-	-	-	-	-	-	4	-	-	-	5	4
Campylium stellatum	-	-	-	5	-	-	-	-	-	-	-	-
Carex demissa	-	-	-	2	-	-	4	-	-	-	-	-
Carex echinata	-	-	-	1	-	-	-	-	-	-	3	-
Carex laevigata	1	-	-	-	-	-	-	-	-	-	-	-
Carex panicea	1	3	4	5	-	-	3	-	-	-	3	-
Carex paniculata	-	-	-	-	-	9	1	-	-	-	4	10
Carex pulicaris	-	1	-	4	-	-	-	-	-	-	1	-
Carex rostrata	-	-	-	-	-	-	4	-	-	-	2	-
Castanea sativa	-	-	-	-	-	-	-	6	-	-	-	-
Cerastium glomeratum	-	-	-	-	-	-	-	-	4	-	-	-
Cerastium semidecandrum	-	-	-	-	2	-	-	-	4	-	-	-
Chamaenerion angustifolium	-	-	-	-	-	2	-	-	-	-	-	-
Circaea lutetiana	-	-	-	-	-	-	-	3	-	-	-	-
Cirsium palustre	-	1	-	1	-	2	1	-	-	-	2	4
Crassula helmsii	-	-	-	-	-	-	-	-	-	-	5	-
Crataegus monogyna	-	-	-	-	-	-	-	6	-	-	-	-
Dactylorhiza maculata	-	3	-	1	-	-	-	-	-	-	-	-
Dactylorhiza praetermissa	-	-	-	-	-	-	2	-	-	-	-	-
Deschampsia flexuosa	-	-	3	-	2	-	-	-	3	2	-	-
Drosera rotundifolia	-	2	-	4	-	-	-	-	-	-	-	-
Dryopteris dilatata	-	-	-	-	-	-	-	2	-	2	-	-
Dryopteris filix-mas	-	-	-	-	-	-	-	2	-	-	-	-
Eleocharis multicaulis	-	-	-	4	-	-	3	-	-	-	-	-
Epilobium hirsutum	2	-	-	-	-	4	-	-	-	-	-	-
Epilobium montanum	-	-	-	-	-	-	-	1	-	-	-	-
Epilobium obscurum	-	2	-	-	-	2	-	-	-	-	-	-
Epilobium palustre	-	-	-	-	-	-	-	-	-	-	-	1
Epilobium parviflorum	2	-	-	-	-	-	-	-	-	-	-	-
Epilobium tetragonum	-	-	-	-	-	-	-	-	-	-	-	2
Equisetum fluviatile	-	-	-	-	-	1	-	-	-	-	4	3
Erica tetralix	-	1	4	4	-	-	-	-	-	-	-	-
Eriophorum angustifolium	-	-	3	3	-	-	3	-	-	-	-	-
Fragaria vesca	-	-	-	-	-	-	-	5	-	-	-	-
Fraxinus excelsior	-	-	-	-	-	-	-	5	-	-	-	-
Galium aparine	-	-	-	-	-	3	-	-	-	3	-	-
Galium palustre	3	-	-	-	-	3	-	-	-	-	3	3
Geranium robertianum	-	-	-	-	-	-	-	1	-	-	-	-
Geum urbanum	-	-	-	-	-	-	-	1	-	-	-	-
Glechoma hederacea	-	-	-	-	-	-	-	4	-	-	-	-
Helosciadium nodiflorum	4	-	-	-	-	1	-	-	-	-	-	1
Holcus lanatus	3	3	1	-	-	2	2	-	-	2	-	4
Hydrocotyle vulgaris	-	4	-	4	-	-	-	-	-	-	4	4

Hypericum elodes	-	4	-	-	-	-	8	-	-	-	-	-
Hypericum tetrapterum	1	-	-	-	-	-	-	-	-	-	2	2
Hypnum cupressiforme	-	-	-	-	-	-	-	-	4	-	-	-
Ilex aquifolium	-	-	-	-	-	-	-	-	-	2	-	-
Juncus acutiflorus	10	-	-	-	-	-	-	-	-	-	3	-
Juncus bufonius	-	-	-	-	2	-	-	-	-	-	5	-
Juncus bulbosus	-	2	2	-	-	-	1	-	-	-	2	-
Juncus effusus	4	-	-	-	-	-	-	-	-	3	1	-
Juncus x surrejanus	-	7	5	-	-	3	2	-	-	-	-	5
Lonicera periclymenum	-	-	-	-	-	-	-	-	-	5	-	-
Lotus pedunculatus	5	3	3	-	-	2	-	-	-	-	4	4
Luzula campestris	-	-	-	-	-	-	-	-	4	-	-	-
Luzula multiflora	-	-	-	2	-	-	-	-	-	-	-	-
Mentha aquatica	5	-	-	-	-	3	2	-	-	-	2	4
Menyanthes trifoliata	-	-	-	-	-	-	-	-	-	-	8	-
Mercurialis perennis	-	-	-	-	-	-	-	3	-	-	-	-
Mnium hornum	-	-	-	-	-	-	-	2	-	-	-	-
Molinia caerulea	-	4	-	5	-	-	4	-	-	-	-	-
Montia fontana	-	-	-	-	-	-	-	-	3	-	-	-
Myosotis discolor	-	-	-	-	1	-	-	-	-	-	-	-
Myosotis secunda	-	-	-	-	-	-	-	-	-	-	-	2
Narthecium ossifragum	-	2	8	4	-	-	-	-	-	-	-	-
Ornithopus perpusillus	-	-	-	-	2	-	-	-	2	-	-	-
Plantago coronopus	-	-	-	-	3	-	-	-	-	-	-	-
Poa annua	-	-	-	-	3	-	-	-	4	-	-	-
Poa nemoralis	-	-	-	-	-	-	-	3	-	-	-	-
Poa trivialis	3	-	-	-	-	-	-	-	-	-	-	3
Potamogeton polygonifolius	-	3	-	5	-	-	4	-	-	-	-	-
Potentilla erecta	-	4	3	3	-	-	-	-	-	-	-	-
Prunella vulgaris	-	1	-	-	-	-	-	-	-	-	-	-
Prunus avium	-	-	-	-	-	-	-	5	-	-	-	-
Pteridium aquilinum	-	-	-	-	-	4	-	7	-	3	-	-
Quercus robur	-	-	-	-	-	-	-	8	-	5	-	-
Ranunculus flammula	2	3	-	-	-	-	1	-	-	-	4	2
Ranunculus repens	3	-	-	-	-	1	-	-	-	-	-	4
Rhytidiadelphus squarrosus	-	-	-	-	4	-	-	-	4	-	-	-
Rosa canina	-	-	-	-	-	4	-	2	-	-	-	-
Rubus fruticosus	-	-	-	-	-	4	-	6	-	9	-	-
Rubus idaeus	-	-	-	-	-	-	-	2	-	-	-	-
Rumex acetosa	-	-	-	-	-	-	-	-	-	-	-	2
Rumex acetosella	-	-	-	-	5	-	-	-	5	-	-	-
Rumex sanguineus	4	-	-	-	-	-	-	3	-	-	-	1
Sagina procumbens	-	-	-	-	2	-	-	-	-	-	2	-
Salix atrocinerea	-	-	1	-	-	1	-	-	-	-	4	2
Salix caprea	-	-	-	-	-	-	-	1	-	-	-	-
Salix x multinervis	-	4	4	2	-	-	1	-	-	-	-	-
Sambucus nigra	-	-	-	-	-	-	-	4	-	-	-	-
Scutellaria minor	-	3	-	-	-	-	1	-	-	-	-	-
Silene flos-cuculi	-	-	-	-	-	-	-	-	-	-	-	3
Solanum dulcamara	-	-	-	-	-	2	-	-	-	-	-	-
Sorbus aucuparia	-	-	-	-	-	-	-	-	-	2	-	-
Sphagnum denticulatum	-	4	8	-	-	-	-	-	-	-	-	-
Sphagnum fallax	2	4	4	-	-	-	-	-	-	-	5	-
Sphagnum palustre	-	-	-	-	-	-	-	-	-	-	2	-
Sphagnum papillosum	-	4	4	-	-	-	-	-	-	-	-	-
Sphagnum squarrosum	-	-	-	-	-	-	4	-	-	-	-	-
Sphagnum subnitens	-	-	-	-	-	-	4	-	-	-	-	-
Stachys sylvatica	-	-	-	-	-	1	-	-	-	-	-	-
Stellaria alsine	1	-	-	-	-	-	-	-	-	-	-	-
Stellaria holostea	-	-	-	-	-	-	-	-	-	3	-	-
Stellaria pallida	-	-	-	-	-	-	-	-	4	-	-	-
Succisa pratensis	-	-	6	4	-	-	-	-	-	-	-	-
Trifolium micranthum	-	-	-	-	2	-	-	-	-	-	-	-
Typha latifolia	2	2	-	-	-	-	1	-	-	-	2	-
Urtica dioica	-	-	-	-	-	4	-	3	-	-	-	-
Veronica arvensis	-	-	-	-	1	-	-	-	4	-	-	-
Veronica montana	-	-	-	-	-	-	-	4	-	-	-	-
Veronica scutellata	-	-	-	-	-	-	4	-	-	-	-	-
Viola palustris	-	-	3	-	-	-	-	-	-	-	-	-
Viola riviniana	-	-	-	-	-	-	-	1	-	-	-	-
Vulpia bromoides	-	-	-	-	5	-	-	-	-	-	-	-

Species recorded by date class

Species	Common name	Status	<1970	<1982	<2010	2010+
Aneura mirabilis	Ghostwort	Axiophyte	-	+	-	-
Aneura pinguis	Greasewort	Axiophyte	+	-	-	+
Aulacomnium palustre	Bog Groove-moss	Axiophyte	+	-	+	+
Calliergonella cuspidata	Pointed Spear-moss	-	-	-	-	+
Campylium stellatum	Yellow Starry Feather-moss	-	+	-	-	+
Dicranum scoparium	Broom Fork-moss	-	-	-	-	+
Hypnum cupressiforme	Cypress-leaved Plait-moss	-	-	-	-	+
Mnium hornum	Swan's-neck Thyme-moss	-	-	-	-	+
Pallavicinia lyellii	Veilwort	-	-	-	+	-
Polytrichastrum formosum	Bank Haircap	-	-	-	+	+
Polytrichum commune	Silkwood	-	-	-	+	+
Polytrichum juniperinum	Juniper Haircap	-	-	-	+	+
Pseudoscleropodium purum	Neat Feather-moss	-	-	-	-	+
Rhodobryum roseum	Rose-moss	Axiophyte	+	-	-	-
Rhytidiadelphus squarrosus	Springy Turf-moss	-	-	-	-	+
Sphagnum capillifolium	Red Bog-moss	Axiophyte	+	-	-	+
Sphagnum compactum	Compact Bog-moss	Axiophyte	+	-	+	-
Sphagnum cuspidatum	Feathery Bog-moss	Axiophyte	+	-	+	-
Sphagnum denticulatum	Cow-horn Bog-moss	Axiophyte	+	-	+	+
Sphagnum fallax	Flat-topped Bog-moss	Axiophyte	+	-	+	+
Sphagnum fimbriatum	Fringed Bog-moss	Axiophyte	+	-	+	-
Sphagnum flexuosum	Flexuous Bog-moss	Axiophyte	+	-	-	-
Sphagnum inundatum	Lesser Cow-horn Bog-moss	Axiophyte	+	-	+	-
Sphagnum magellanicum	Magellanic Bog-moss	Axiophyte	+	-	+	-
Sphagnum palustre	Blunt-leaved Bog-moss	Axiophyte	+	-	+	+
Sphagnum papillosum	Papillose Bog-moss	Axiophyte	+	-	+	+
Sphagnum squarrosum	Spiky Bog-moss	Axiophyte	+	-	+	+
Sphagnum subnitens	Lustrous Bog-moss	Axiophyte	+	-	-	+
Sphagnum tenellum	Soft Bog-moss	Axiophyte	+	-	-	-
Acer campestre	Field Maple	-	-	+	+	+
Acer pseudoplatanus	Sycamore	-	-	+	+	+
Achillea millefolium	Yarrow	-	+	+	+	+
Achillea ptarmica	Sneezewort	Axiophyte	+	-	-	-
Adoxa moschatellina	Moschatel	Axiophyte	-	+	+	+
Aegopodium podagraria	Ground-elder	-	+	+	+	+
Aesculus hippocastanum	Horse-chestnut	-	-	+	+	+
Agrostis canina	Velvet Bent	-	-	+	+	+
Agrostis capillaris	Common Bent	-	+	+	+	+
Agrostis stolonifera	Creeping Bent	-	-	+	+	+
Agrostis vinealis	Brown Bent	Axiophyte	-	+	-	+
Aira caryophyllea	Silver Hair-grass	Axiophyte	+	-	-	-
Aira praecox	Early Hair-grass	Axiophyte	-	+	+	+
Ajuga reptans	Bugle	-	-	-	-	+
Alisma plantago-aquatica	Water-plantain	-	+	-	+	+
Alliaria petiolata	Garlic Mustard	-	-	+	+	+
Alnus cordata	Italian Alder	-	-	-	-	+
Alnus glutinosa	Alder	-	-	+	+	+
Alnus x elliptica	Hybrid Italian Alder	-	-	-	-	+
Anacamptis pyramidalis	Pyramidal Orchid	Axiophyte	-	-	-	+
Anchusa arvensis	Bugloss	-	-	+	+	+
Anemone nemorosa	Wood Anemone	Axiophyte	-	+	+	+
Angelica sylvestris	Wild Angelica	-	-	+	+	+
Anisantha sterilis	Barren Brome	-	-	+	+	+
Anthoxanthum odoratum	Sweet Vernal Grass	-	-	+	+	+
Anthriscus sylvestris	Cow Parsley	-	-	+	+	+
Aphanes australis	Slender Parsley-piert	-	-	+	+	+
Arctium minus	Lesser Burdock	-	+	+	+	+
Arenaria serpyllifolia	Thyme-leaved Sandwort	-	-	+	+	+
Arrhenatherum elatius	False Oat-grass	-	-	+	+	+
Artemisia vulgaris	Mugwort	-	+	+	+	+
Arum italicum	Italian Lords-and-ladies	-	-	+	+	+
Arum maculatum	Lords-and-ladies	-	+	+	+	+
Athyrium filix-femina	Lady Fern	Axiophyte	-	+	+	+
Atriplex patula	Common Orache	-	-	-	-	+
Atriplex prostrata	Spear-leaved Orache	-	-	-	+	+
Bellis perennis	Daisy	-	+	+	+	+

Betula pendula	Silver Birch	-	-	+	+	+
Betula pubescens	Downy Birch	-	-	+	+	+
Bidens cernua	Nodding Bur-marigold	Axiophyte	+	-	-	-
Brachypodium sylvaticum	False-brome	-	-	+	+	+
Bromus hordeaceus	Soft-brome	-	-	+	+	+
Bryonia dioica	White Bryony	-	-	+	+	+
Buddleja davidii	Butterfly-bush	-	-	-	+	+
Callitriche brutia	Intermediate Water-starwort	-	-	-	+	-
Callitriche stagnalis	Common Water-starwort	-	-	-	+	+
Calluna vulgaris	Heather	Axiophyte	+	+	+	+
Caltha palustris	Marsh Marigold	Axiophyte	+	+	+	+
Calystegia sepium	Hedge Bindweed	-	+	+	+	+
Calystegia silvatica	Large Bindweed	-	-	+	-	+
Campanula rotundifolia	Harebell	Axiophyte	+	+	+	+
Capsella bursa-pastoris	Shepherd's-purse	-	+	+	+	+
Cardamine flexuosa	Wavy Bitter-cress	-	-	+	+	+
Cardamine hirsuta	Hairy Bitter-cress	-	-	+	+	+
Cardamine pratensis	Cuckooflower	-	+	+	+	+
Carex binervis	Green-ribbed Sedge	Axiophyte	+	+	+	+
Carex demissa	Common Yellow Sedge	Axiophyte	+	+	+	+
Carex divulsa	Grey Sedge	-	-	+	+	+
Carex echinata	Star Sedge	Axiophyte	+	+	+	+
Carex hirta	Hairy Sedge	-	+	+	+	+
Carex laevigata	Smooth-stalked Sedge	Axiophyte	+	+	-	+
Carex leporina	Oval Sedge	-	+	+	+	+
Carex nigra	Common Sedge	Axiophyte	+	+	+	+
Carex panicea	Carnation Sedge	Axiophyte	+	+	+	+
Carex paniculata	Greater Tussock-sedge	Axiophyte	+	+	+	+
Carex pendula	Pendulous Sedge	-	-	-	+	+
Carex pilulifera	Pill Sedge	Axiophyte	+	+	+	+
Carex pseudocyperus	Cyperus Sedge	Axiophyte	-	-	-	+
Carex pulicaris	Flea Sedge	Axiophyte	+	+	+	+
Carex remota	Remote Sedge	-	-	+	+	+
Carex rostrata	Bottle Sedge	Axiophyte	+	+	-	+
Carex sylvatica	Wood-sedge	Axiophyte	-	-	+	+
Carex x boenninghausiana	Remote x Tussock Sedge	-	+	-	-	-
Carpinus betulus	Hornbeam	Axiophyte	-	+	-	+
Castanea sativa	Sweet Chestnut	-	-	+	+	+
Centaurium erythraea	Common Centaury	-	+	+	+	+
Cerastium arvense	Field Mouse-ear	Axiophyte	+	+	-	-
Cerastium fontanum	Common Mouse-ear	-	-	+	+	+
Cerastium glomeratum	Sticky Mouse-ear	-	-	+	+	+
Cerastium semidecandrum	Little Mouse-ear	-	-	+	+	+
Ceratocapnos claviculata	Climbing Corydalis	Axiophyte	-	+	-	+
Chaerophyllum temulum	Rough Chervil	-	-	+	+	+
Chamaenerion angustifolium	Rosebay Willowherb	-	-	+	+	+
Chenopodium album	Fat-hen	-	-	+	+	+
Chenopodium hybridum	Maple-leaved Goosefoot	-	-	-	-	+
Chrysosplenium oppositifolium	Opposite-leaved Golden-saxifrage	Axiophyte	-	-	+	+
Circaea lutetiana	Enchanter's-nightshade	-	-	+	+	+
Cirsium arvense	Creeping Thistle	-	-	+	+	+
Cirsium palustre	Marsh Thistle	-	+	+	+	+
Cirsium vulgare	Spear Thistle	-	-	+	+	+
Claytonia sibirica	Pink Purslane	-	-	-	+	+
Clematis vitalba	Traveller's Joy	-	-	+	-	+
Corylus avellana	Hazel	-	-	+	+	+
Crassula helmsii	New Zealand Pigmyweed	-	-	-	+	+
Crataegus monogyna	Hawthorn	-	+	+	+	+
Crataegus x media	Common x Midland Hawthorn	-	-	-	-	+
Crepis capillaris	Smooth Hawk's-beard	-	-	+	+	+
Crocosmia x crocosmiiflora	Montbretia	-	-	-	-	+
Cuscuta epithymum	Dodder	Axiophyte	+	-	-	-
Dactylis glomerata	Cock's-foot	-	-	+	+	+
Dactylorhiza maculata	Heath Spotted-orchid	Axiophyte	+	+	+	+
Dactylorhiza praetermissa	Southern Marsh-orchid	Axiophyte	+	+	+	+
Dactylorhiza x hallii	Southern Heath Spotted-orchid	-	+	-	+	+
Danthonia decumbens	Heath-grass	Axiophyte	+	+	-	+
Daucus carota	Wild Carrot	-	-	-	-	+
Deschampsia flexuosa	Wavy Hair-grass	Axiophyte	-	+	+	+
Digitalis purpurea	Foxglove	-	-	+	+	+
Drosera rotundifolia	Round-leaved Sundew	Axiophyte	+	+	+	+

Dryopteris affinis	Scaly Male-fern	Axiophyte	-	-	+	+
Dryopteris carthusiana	Narrow Buckler-fern	Axiophyte	+	+	+	+
Dryopteris dilatata	Broad Buckler-fern	-	-	+	+	+
Dryopteris filix-mas	Common Male Fern	-	-	+	+	+
Dryopteris x deweveri	Hybrid Buckler-fern	-	-	-	-	+
Eleocharis multicaulis	Many-stalked Spike-rush	Axiophyte	+	+	+	+
Eleocharis palustris	Common Spike-rush	Axiophyte	+	+	+	+
Epilobium ciliatum	American Willowherb	-	-	+	+	+
Epilobium hirsutum	Great Willowherb	-	-	+	+	+
Epilobium montanum	Broad-leaved Willowherb	-	-	-	-	+
Epilobium obscurum x palustre	Short-fruited x Marsh Willowherb	-	+	-	-	-
Epilobium obscurum	Short-fruited Willowherb	-	+	+	+	+
Epilobium palustre	Marsh Willowherb	Axiophyte	+	+	+	+
Epilobium parviflorum	Hoary Willowherb	-	-	-	+	+
Epilobium tetragonum	Square-stalked Willowherb	-	-	-	-	+
Equisetum arvense	Field Horsetail	-	-	+	+	+
Equisetum fluviatile	Water Horsetail	Axiophyte	-	+	+	+
Erica tetralix	Cross-leaved Heath	Axiophyte	+	+	+	+
Erigeron canadensis	Canadian Fleabane	-	-	-	-	+
Erigeron floribundus	Bilbao's Fleabane	-	-	-	-	+
Eriophorum angustifolium	Common Cottongrass	Axiophyte	+	+	+	+
Erodium cicutarium	Common Stork's-bill	-	-	+	+	+
Erodium maritimum	Sea Stork's-bill	-	-	-	-	+
Erophila verna	Common Whitlowgrass	-	+	+	+	+
Erythranthe moschata	Musk	-	-	-	-	+
Fagus sylvatica	Beech	-	-	+	+	+
Festuca ovina	Sheep's Fescue	-	-	-	+	+
Festuca rubra	Red Fescue	-	-	+	+	+
Ficaria verna	Lesser Celandine	-	+	+	+	+
Filago minima	Small Cudweed	Axiophyte	+	+	-	-
Fragaria vesca	Wild Strawberry	-	-	+	+	+
Frangula alnus	Alder Buckthorn	Axiophyte	+	-	+	+
Fraxinus excelsior	Ash	-	-	+	-	+
Galeopsis bifida	Bifid Hemp-nettle	-	-	-	-	+
Galium album	Hedge Bedstraw	-	-	+	+	+
Galium aparine	Cleavers	-	+	+	+	+
Galium palustre	Common Marsh-bedstraw	-	-	+	+	+
Galium saxatile	Heath Bedstraw	Axiophyte	+	+	+	+
Galium uliginosum	Fen Bedstraw	Axiophyte	+	-	-	-
Genista anglica	Petty Whin	Axiophyte	+	+	-	-
Geranium dissectum	Cut-leaved Crane's-bill	-	-	+	+	+
Geranium molle	Dove's-foot Crane's-bill	-	-	+	+	+
Geranium pusillum	Small-flowered Crane's-bill	-	+	+	+	+
Geranium pyrenaicum	Hedgerow Crane's-bill	-	-	-	-	+
Geranium robertianum	Herb-robert	-	+	+	+	+
Geranium rotundifolium	Round-leaved Crane's-bill	-	-	-	-	+
Geranium x oxonianum	Druce's Crane's-bill	-	-	-	+	+
Geum urbanum	Wood Avens	-	-	+	+	+
Glechoma hederacea	Ground-ivy	-	-	+	+	+
Glyceria fluitans	Floating Sweet-grass	-	-	+	+	+
Glyceria notata	Plicate Sweet-grass	Axiophyte	-	-	+	+
Gnaphalium uliginosum	Marsh Cudweed	-	+	-	+	+
Hedera helix	Ivy	-	-	+	+	+
Helosciadium inundatum	Lesser Marshwort	Axiophyte	+	-	-	-
Helosciadium nodiflorum	Fool's Watercress	-	+	+	+	+
Heracleum sphondylium	Hogweed	-	-	+	+	+
Hesperis matronalis	Dame's Violet	-	-	-	-	+
Holcus lanatus	Yorkshire-fog	-	-	+	+	+
Holcus mollis	Creeping Soft-grass	-	-	+	+	+
Hyacinthoides non-scripta	Bluebell	Axiophyte	-	+	+	+
Hydrocotyle vulgaris	Marsh Pennywort	Axiophyte	+	+	+	+
Hypericum androsaemum	Tutsan	-	-	-	+	+
Hypericum elodes	Marsh St John's-wort	Axiophyte	+	+	+	+
Hypericum humifusum	Trailing St John's-wort	Axiophyte	+	-	+	+
Hypericum perforatum	Perforate St John's-wort	-	-	+	+	+
Hypericum pulchrum	Slender St John's-wort	Axiophyte	+	-	+	-
Hypericum tetrapterum	Square-stalked St John's-wort	-	-	-	+	+
Hypochaeris glabra	Smooth Cat's-ear	Axiophyte	+	-	-	-
Hypochaeris radicata	Cat's-ear	-	+	+	+	+
Ilex aquifolium	Holly	-	-	+	+	+
Iris foetidissima	Stinking Iris	-	-	-	-	+

Iris pseudacorus	Yellow Iris	-	+	+	+	+
Isolepis setacea	Bristle Club-rush	Axiophyte	+	+	+	+
Jacobaea vulgaris	Ragwort	-	+	+	+	+
Juncus acutiflorus	Sharp-flowered Rush	Axiophyte	+	+	+	+
Juncus articulatus	Jointed Rush	-	-	+	+	+
Juncus bufonius	Toad Rush	-	+	+	+	+
Juncus bulbosus	Bulbous Rush	Axiophyte	+	+	+	+
Juncus conglomeratus	Compact Rush	-	+	+	+	+
Juncus effusus	Soft-rush	-	+	+	+	+
Juncus inflexus	Hard Rush	-	-	+	+	+
Juncus squarrosus	Heath Rush	-	+	+	+	+
Juncus tenuis	Slender Rush	-	-	-	-	+
Juncus x surrejanus	Jointed x Sharp-flowered Rush	-	-	-	-	+
Lamium album	White Dead-nettle	-	+	+	+	+
Lapsana communis	Nipplewort	-	+	+	+	+
Lathyrus pratensis	Meadow Vetchling	-	-	+	+	+
Lemna minor	Common Duckweed	-	-	+	+	+
Lemna minuta	Least Duckweed	-	-	-	+	+
Leontodon saxatilis	Lesser Hawkbit	-	+	+	+	+
Lepidium campestre	Field Pepperwort	Axiophyte	+	-	-	-
Lepidium draba	Hoary Cress	-	-	+	+	+
Linum radiola	Allseed	-	+	-	-	-
Lolium perenne	Perennial Rye-grass	-	+	+	+	+
Lonicera periclymenum	Honeysuckle	-	+	+	+	+
Lotus corniculatus	Common Bird's-foot-trefoil	-	+	+	+	+
Lotus pedunculatus	Large Bird's-foot-trefoil	-	-	+	+	+
Luzula campestris	Field Wood-rush	-	+	+	+	+
Luzula multiflora	Heath Wood-rush	Axiophyte	+	+	+	+
Lycopodiella inundata	Marsh Clubmoss	Axiophyte	+	-	-	-
Lycopodium clavatum	Stag's-horn Clubmoss	Axiophyte	+	-	-	-
Lycopus europaeus	Gipsywort	-	-	-	-	+
Lysimachia arvensis	Scarlet Pimpernel	-	+	+	+	+
Lysimachia minima	Chaffweed	Axiophyte	+	-	-	-
Lysimachia tenella	Bog Pimpernel	Axiophyte	+	+	+	+
Lythrum portula	Water Purslane	Axiophyte	+	+	+	+
Lythrum salicaria	Purple-loosestrife	-	+	-	+	+
Mahonia aquifolium	Oregon Grape	-	-	-	-	+
Malus domestica	Apple	-	-	+	+	+
Malva sylvestris	Common Mallow	-	-	+	+	+
Marrubium vulgare	White Horehound	-	+	-	-	-
Matricaria discoidea	Pineapple Weed	-	-	+	+	+
Medicago arabica	Spotted Medick	-	-	+	+	+
Mentha aquatica	Water Mint	-	+	+	+	+
Mentha x villosa	Apple-mint	-	+	+	+	-
Menyanthes trifoliata	Bogbean	Axiophyte	+	+	+	+
Mercurialis perennis	Dog's Mercury	-	+	+	+	+
Moehringia trinervia	Three-nerved Sandwort	-	-	+	+	+
Moenchia erecta	Upright Chickweed	Axiophyte	+	+	+	-
Molinia caerulea	Purple Moor-grass	Axiophyte	+	+	+	+
Montia fontana	Blinks	Axiophyte	+	-	+	+
Mycelis muralis	Wall Lettuce	-	-	-	-	+
Myosotis arvensis	Field Forget-me-not	-	-	+	+	+
Myosotis discolor	Changing Forget-me-not	Axiophyte	-	+	+	+
Myosotis secunda	Creeping Forget-me-not	Axiophyte	+	+	+	+
Myrica gale	Bog Myrtle	-	-	-	-	+
Narcissus sp.	Daffodil	-	-	-	-	+
Nardus stricta	Mat-grass	Axiophyte	+	+	-	+
Narthecium ossifragum	Bog Asphodel	Axiophyte	+	+	+	+
Neottia ovata	Common Twayblade	Axiophyte	+	+	-	+
Oenanthe crocata	Hemlock Water-dropwort	-	-	+	+	+
Oenanthe fistulosa	Tubular Water-dropwort	Axiophyte	+	-	-	-
Ophrys apifera	Bee Orchid	-	+	-	-	-
Ornithogalum umbellatum	Star-of-Bethlehem	-	+	-	+	+
Ornithopus perpusillus	Bird's-foot	Axiophyte	+	+	+	+
Pedicularis sylvatica	Lousewort	Axiophyte	+	+	+	+
Pentaglottis sempervirens	Green Alkanet	-	-	+	+	+
Persicaria hydropiper	Water-pepper	-	-	-	+	+
Persicaria maculosa	Redshank	-	-	+	+	+
Phalaris arundinacea	Reed Canary-grass	-	-	-	-	+
Pilosella officinarum	Mouse-ear-hawkweed	-	+	+	+	+
Pinus nigra	Austrian Pine	-	-	-	-	+

Pinus sylvestris	Scots Pine	-	-	+	+	+
Plantago coronopus	Buck's-horn Plantain	Axiophyte	-	+	+	+
Plantago lanceolata	Ribwort Plantain	-	+	+	+	+
Plantago major	Greater Plantain	-	+	+	+	+
Poa annua	Annual Meadow-grass	-	-	+	+	+
Poa nemoralis	Wood Meadow-grass	Axiophyte	-	+	-	+
Poa pratensis	Smooth Meadow-grass	-	-	+	+	+
Poa trivialis	Rough Meadow-grass	-	-	+	+	+
Polygala serpyllifolia	Heath Milkwort	Axiophyte	+	+	+	+
Polygonum arenastrum	Equal-leaved Knotgrass	-	-	+	+	+
Polygonum aviculare	Knotgrass	-	+	+	+	+
Populus alba	White Poplar	-	-	-	-	+
Populus tremula	Aspen	Axiophyte	-	+	+	+
Potamogeton coloratus	Fen Pondweed	Axiophyte	+	-	-	-
Potamogeton polygonifolius	Bog Pondweed	Axiophyte	+	+	+	+
Potentilla anserina	Silverweed	-	+	+	+	+
Potentilla erecta	Tormentil	Axiophyte	+	+	+	+
Potentilla reptans	Creeping Cinquefoil	-	+	+	+	+
Potentilla sterilis	Barren Strawberry	-	+	+	+	+
Primula vulgaris	Primrose	-	-	+	+	+
Prunella vulgaris	Selfheal	-	+	+	+	+
Prunus avium	Wild Cherry	-	-	+	+	+
Prunus laurocerasus	Cherry Laurel	-	-	+	+	+
Prunus serotina	Rum Cherry	-	-	-	-	+
Prunus spinosa	Blackthorn	-	-	+	+	+
Pseudotsuga menziesii	Douglas Fir	-	-	+	-	+
Pteridium aquilinum	Bracken	-	+	+	+	+
Pulicaria dysenterica	Fleabane	-	+	+	+	+
Quercus cerris	Turkey Oak	-	-	+	+	+
Quercus robur	Pedunculate Oak	-	-	+	+	+
Ranunculus acris	Meadow Buttercup	-	-	+	+	+
Ranunculus bulbosus	Bulbous Buttercup	-	+	+	+	+
Ranunculus flammula	Lesser Spearwort	Axiophyte	+	+	+	+
Ranunculus repens	Creeping Buttercup	-	+	+	+	+
Ranunculus sceleratus	Celery-leaved Buttercup	-	-	-	-	+
Ranunculus tripartitus	Three-lobed Crowfoot	-	+	-	+	+
Rhamnus cathartica	Buckthorn	Axiophyte	-	-	-	+
Ribes rubrum	Red Currant	-	-	+	+	+
Ribes uva-crispa	Gooseberry	-	-	+	+	+
Rosa arvensis	Field Rose	-	-	+	+	+
Rosa canina	Dog Rose	-	-	+	+	+
Rubus fruticosus	Bramble	-	+	+	+	+
Rubus idaeus	Raspberry	-	+	+	+	+
Rumex acetosa	Common Sorrel	-	-	+	+	+
Rumex acetosella	Sheep's Sorrel	-	+	+	+	+
Rumex conglomeratus	Clustered Dock	-	+	+	+	+
Rumex crispus	Curled Dock	-	-	+	+	+
Rumex obtusifolius	Broad-leaved Dock	-	+	+	+	+
Rumex sanguineus	Wood Dock	-	-	+	+	+
Sagina apetala	Annual Pearlwort	-	+	+	+	-
Sagina filicaulis	Slender Pearlwort	-	-	-	-	+
Sagina procumbens	Procumbent Pearlwort	-	+	+	+	+
Salix atrocinerea	Grey Willow	-	-	+	+	+
Salix aurita	Eared Willow	Axiophyte	+	-	-	-
Salix caprea	Goat Willow	-	-	+	+	+
Salix x fragilis	Crack-willow	-	-	+	-	+
Salix x multinervis	Grey x Eared Willow	-	-	-	-	+
Salix x reichardtii	Grey Goat-willow	-	-	-	-	+
Sambucus nigra	Elder	-	+	+	+	+
Schedonorus arundinaceus	Tall Fescue	-	-	+	+	+
Schedonorus giganteus	Giant Fescue	-	-	-	-	+
Scirpus sylvaticus	Wood Club-rush	Axiophyte	-	-	-	+
Scleranthus annuus	Annual Knawel	Axiophyte	+	-	-	-
Scrophularia auriculata	Water Figwort	-	+	+	+	+
Scrophularia nodosa	Common Figwort	-	-	+	+	+
Scutellaria minor	Lesser Skullcap	Axiophyte	+	+	+	+
Sequoiadendron giganteum	Wellingtonia	-	-	+	-	+
Silene dioica	Red Campion	-	+	+	+	+
Silene flos-cuculi	Ragged Robin	Axiophyte	+	+	+	+
Sison amomum	Stone Parsley	-	-	-	-	+
Sisymbrium officinale	Hedge Mustard	-	-	+	+	+

Solanum dulcamara	Bittersweet	-	-	+	+	+
Solanum nigrum	Black Nightshade	-	+	+	+	+
Solidago gigantea	Early Goldenrod	-	-	-	+	+
Sonchus arvensis	Perennial Sow-thistle	-	-	+	+	+
Sonchus asper	Prickly Sow-thistle	-	-	+	+	+
Sonchus oleraceus	Smooth Sow-thistle	-	-	+	+	+
Sorbus aucuparia	Rowan	-	-	-	+	+
Sparganium erectum	Branched Bur-reed	-	-	+	+	+
Spergula arvensis	Corn Spurrey	Axiophyte	+	-	-	-
Spergularia rubra	Sand Spurrey	Axiophyte	+	+	+	+
Stachys sylvatica	Hedge Woundwort	-	-	+	+	+
Stellaria alsine	Bog Stitchwort	Axiophyte	+	+	+	+
Stellaria graminea	Lesser Stitchwort	-	+	+	+	+
Stellaria holostea	Greater Stitchwort	-	+	+	+	+
Stellaria media	Chickweed	-	+	+	+	+
Stellaria pallida	Lesser Chickweed	-	-	+	+	+
Succisa pratensis	Devil's-bit Scabious	Axiophyte	+	+	+	+
Symphoricarpos albus	Snowberry	-	-	-	-	+
Symphyotrichum x versicolor	Late Michaelmas-daisy	-	-	+	-	+
Syringa vulgaris	Lilac	-	-	-	+	+
Tamus communis	Black Bryony	-	-	+	+	+
Taraxacum officinale	Dandelion	-	+	+	-	+
Taxus baccata	Yew	-	-	+	+	+
Teucrium scorodonia	Wood Sage	-	+	+	+	+
Thymus pulegioides	Large Thyme	Axiophyte	+	-	-	-
Torilis japonica	Upright Hedge-parsley	-	-	+	+	+
Trifolium dubium	Lesser Trefoil	-	-	+	+	+
Trifolium glomeratum	Clustered Clover	Axiophyte	+	+	+	+
Trifolium micranthum	Slender Trefoil	-	+	+	+	+
Trifolium ornithopodioides	Bird's-foot Clover	Axiophyte	-	+	+	+
Trifolium repens	White Clover	-	-	+	+	+
Trifolium subterraneum	Subterranean Clover	Axiophyte	+	+	+	+
Trifolium suffocatum	Suffocated Clover	Axiophyte	-	-	+	+
Triglochin palustris	Marsh Arrowgrass	Axiophyte	-	+	-	+
Typha latifolia	Great Reedmace	-	+	+	+	+
Typha x glauca	Hybrid Reedmace	-	-	-	-	+
Ulex europaeus	Gorse	-	+	+	+	+
Ulex gallii	Western Gorse	Axiophyte	+	+	+	+
Ulex minor	Dwarf Gorse	Axiophyte	+	+	+	+
Ulmus minor	Small-leaved Elm	-	-	-	-	+
Ulmus procera	English Elm	-	-	+	+	+
Urtica dioica	Stinging Nettle	-	-	+	+	+
Verbascum blattaria	Moth Mullein	-	+	-	-	-
Verbena officinalis	Vervain	-	+	-	+	+
Veronica arvensis	Wall Speedwell	-	-	+	+	+
Veronica chamaedrys	Germander Speedwell	-	+	+	+	+
Veronica hederifolia	Ivy-leaved Speedwell	-	-	+	+	+
Veronica montana	Wood Speedwell	Axiophyte	-	+	-	+
Veronica officinalis	Heath Speedwell	Axiophyte	-	+	+	+
Veronica polita	Grey Field-speedwell	-	-	-	-	+
Veronica scutellata	Marsh Speedwell	Axiophyte	+	-	+	+
Veronica serpyllifolia	Thyme-leaved Speedwell	-	-	+	+	+
Viburnum opulus	Guelder-rose	-	-	-	-	+
Vicia sativa	Common Vetch	-	-	+	+	+
Vicia sepium	Bush Vetch	-	-	+	+	+
Vinca major	Greater Periwinkle	-	-	+	+	+
Viola canina	Heath Dog-violet	Axiophyte	+	-	-	-
Viola odorata	Sweet Violet	-	+	-	+	+
Viola palustris	Marsh Violet	Axiophyte	+	+	+	+
Viola reichenbachiana	Early Dog-violet	Axiophyte	-	-	-	+
Viola riviniana	Common Dog-violet	-	-	+	+	+
Vulpia bromoides	Squirrel-tail Fescue	-	-	+	+	+
Vulpia ciliata	Bearded Fescue	-	+	+	+	-
Vulpia myuros	Rat's-tail Fescue	-	-	-	+	+
No. vascular plant species			168	277	292	351

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The following have submitted records to the data sources listed above, as recorders (or sometimes determiners). This includes both current and historical recorders.

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Other information used in this report includes:

- Kent Botanical Recording Group records since 2010
- JNCC's Threatened Plants Database (a survey of the bogs by N.F. Stewart in 1998)
- My own visits to Hothfield, sometimes with Ros Bennett while conducting Field Skills Tests for the Kent Wildlife Trust, or while leading other courses for KWT and Canterbury Christ Church University
- Data from the Herbaria at Home web site, derived from herbarium specimens in the Natural History Museum (**BM**), Kew (**K**) and the South London Botanical Institute (**SLBI**)
- The unpublished manuscript Flora of Kent by Francis Rose (version 8), edited by Geoffrey Kitchener
- Database of the bryological herbarium of the National Museum of Wales (**BBSUK**)
- 'Hothfield Notable Bryophytes' by Stephen Lemon (unpublished report to KWT)
- Information from Natural England's scientific files, kindly supplied by Phil Williams
- Extract from the Kent Wildlife Trust database, compiled by KWT and the Kent Biological Records Centre
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