Flora of Ashdown Forest

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COVER ILLUSTRATIONS

Front: Marsh gentians (*Gentiana pneumonanthe*) (del. P. Donovan).
Back: Ivy-leaved bell-flower (*Wahlenbergia hederacea*) (del. P. Donovan).

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INTRODUCTION

Our *Flora of Ashdown Forest* had two aims. First, to document the flora of a superb area of East Sussex and enjoy ourselves doing it. Second, to demonstrate that it is practical to carry out a large scale botanical survey in a standardised manner.

Ashdown Forest is a large area of wilderness in the High Weald of Sussex to which there are several recent guides (Glyn & Prendergast 1995; Willard 1989), and to which there is open access. It is an area of considerable importance for nature conservation, landscape, history and literature. There is a good selection of heathland plants with specialities such as marsh gentians, sundews and bog asphodels, birds such as nightjars and Dartford warblers, and invertebrates such as dragonflies, butterflies and the great raft spider. There are panoramic views over four counties and the North and South Downs, as well as many quiet and secluded corners (including some sad and boggy ones). There are historic features such as tumuli, rabbit warrens, the remains of iron workings and their associated blast furnaces, and a Roman road. The Forest is also known as the home of Winnie-the-Pooh. We have much enjoyed recording the plants and relating our finds to the Forest's landscape, history and literature, and we hope you will enjoy reading it.

Our flora covers the 71 1-km X 1-km squares in which the land which is part of Ashdown Forest occurs (Figure 1). It thus includes the land within the original Forest pale (i.e. the bank and ditch around the Forest), the in-takes within the pale, and some of the adjacent land outside the pale.

A degree of standardisation in recording for modern floras is long overdue. It is now well-established that the recording behaviour and ability of individual botanists, the types of plants being recorded, and the survey techniques give rise to marked variations in the records of different plants. Most records for modern floras are collected on an *ad hoc* basis, with the time and effort spent recording varying markedly between grid squares resulting in unknown variations in the quality and quantity of records. These factors impose limitations on the use of the data for other purposes, such as monitoring environmental change or correlation against environmental variables as the data for different species or different areas are not comparable (Rich & Woodruff 1990, 1992, 1996; Rich & Smith 1996); the extent to which the resulting distribution maps are representative of the plants rather than the botanists is simply not known.

We have therefore used a standardised survey method to minimise recording bias and have endeavoured to put equal effort into each area. The main features of the survey have been to try to standardise the recording and minimise recording bias following the recommendations of Rich & Smith (1996), by:

1. Improving the botanical skills of the botanists;
2. Encouraging recorders to visit as many different areas as possible;
3. Achieving even coverage by recording for the same number of hours in each square;
4. Visiting as many habitats as possible in each square, and ensuring all are visited during the course of the work;
5. Ensuring adequate seasonal coverage.

To this can be added that co-ordination, and feedback of information and progress to all recorders was essential in keeping up the quality of the work. We aimed for a target of ten hours recording in each square by a mixture of different botanists, which was broadly achieved. Good comparable coverage was obtained with botanists of varying abilities, and the defined recording target was a useful incentive to completing the work. We have accepted from the outset that the records would not be comprehensive, and we know that more plants remain to be found in our squares - it is simply impractical to find every different species. Analysis of the records shows that our survey is representative of the flora and our maps are largely independent of the botanists (excepting critical taxa). Our relative species-frequencies are also representative and indicate which plants are rare or common in the area, and the distribution patterns can be related directly to environment factors.

This flora therefore sets new standards for recording in Britain, and it is recommended that all future atlases should follow a similar approach. The methods can be applied to areas of any size, and allow direct comparison with subsequent standardised surveys to assess change.

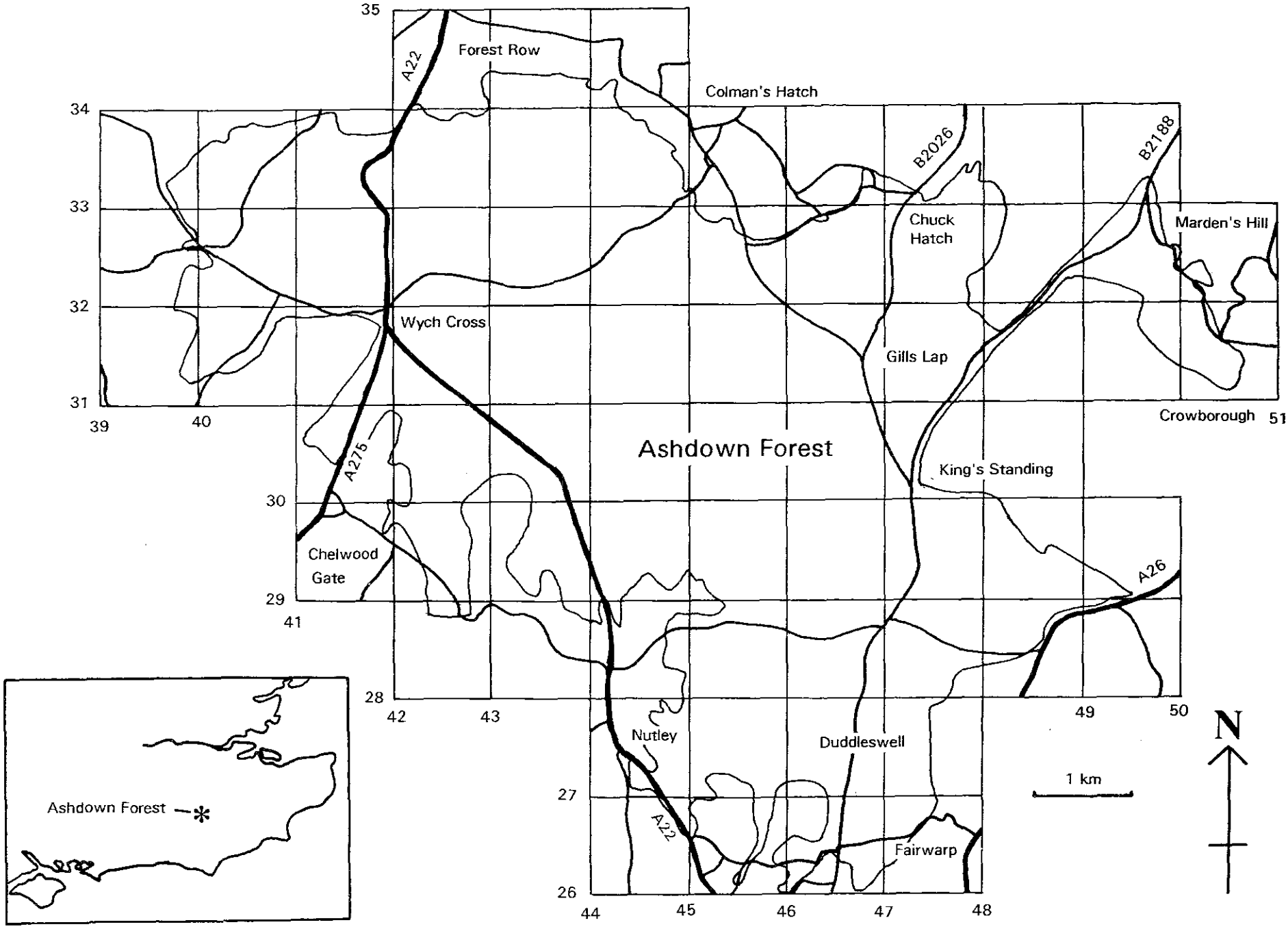


Figure 1. 1-km squares recorded for the Ashdown Forest Flora.

THE HABITATS OF ASHDOWN FOREST

History

Ashdown Forest has a long and well-documented history. Glyn & Prendergast (1995) give a readable summary but a few significant dates are briefly mentioned here.

The Forest appears to have been occupied initially by nomadic hunter-gatherers and seasonal farmers, then settled permanently. Amongst the earliest records of human activity found are a Stone Age axe about 100,000 years old, and flint flakes have been found in many sites, usually on hillsides. There are also Bronze Age, Iron Age and Roman remains.

The Forest was 'empaled' in about 1300 by Edward I, enclosing an area of some 14,000 acres, and those that farmed the land at that time became 'tenants by custom'. In 1372 the deer forest was granted to John of Gaunt, Duke of Lancaster, and became known as Lancaster Great Park. During the Civil War, the Forest was put up as surety against army wages, the deer were wiped out and the pale destroyed. At the Restoration in 1660 the Forest was granted to the Earl of Dorset. In 1693, a Duchy Decree allowed half of the Forest to be enclosed and sold off, mainly to a rabbit farmer, hence the name 'warren' which is still used for many Forest areas today (for example, Broadstone Warren and Hindleap Warren). 1717 brought the end of the iron industry which had thrived in the area since before Roman times.

In 1885, the first Ashdown Forest Act gave power to the Board of Conservators to regulate land use, representing the interests of the owner and the customary tenants or 'commoners'. The most recent Act in 1974 set up the Forest management as we know it today. It gave the public free access on foot to the whole area, established the Bye-laws, described the constitution of the Board of Conservators and funding of the management. In 1988, the Forest was bought by East Sussex County Council with help from a public appeal.

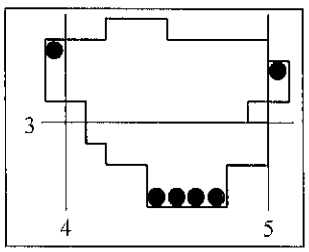
Throughout the history of the Forest the activities of the Commoners have produced the mosaic of habitats present today in which our plants grow. Grazing domestic animals, cutting fuel, bedding and thatching material and controlled burning have created and maintained the heathlands. The recent decline in Forest 'farming' due to the changing social position of the Commoners and the increase in road traffic which prevents free grazing, have allowed the massive spread of scrub and secondary woodland. This is now the major factor causing change to the flora of the Forest.

Geology and soils

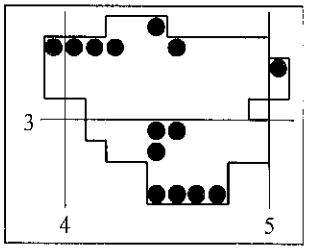
The geology and soils are important in providing the substrate that the plants grow in, and are one of the major factors determining plant distribution at our local scale. The geology has little direct effect on the plants as it is overlain by soils which are largely silty and compacted resulting in poor drainage.

Ashdown Forest occupies the northern sandstone ridge in the High Weald. It is mainly underlain by the Ashdown Beds, a relatively resistant mixture of interbedded sandstones, silts, sands and clays. Around the edges there are also beds of Wadhurst Clay, consisting of mudstones and shales with some shelly limestones, and Tunbridge Wells Sandstone, composed of silts and silty sandstone. These strata were laid down in shallow water and were uplifted about 65 million years ago at the same time as the Alps, and have subsequently been eroded to produce the topography and land form that we see today. There are also superficial alluvium deposits in the valleys which mask the underlying geology. Full details of the geology and land form can be found in Bristow & Bazley (1972) and Robinson & Williams (1984).

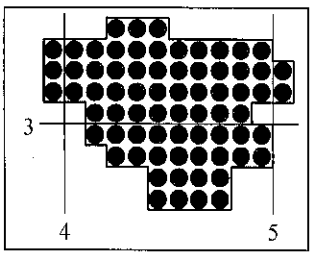
Tunbridge Wells Sandstone



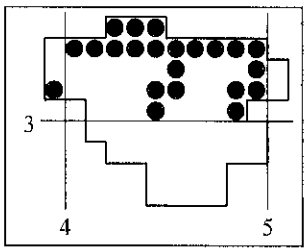
Wadhurst Clay



Ashdown Beds



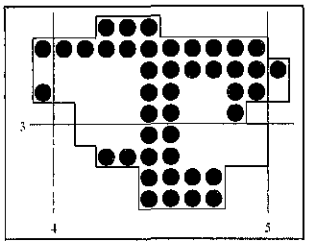
Alluvium



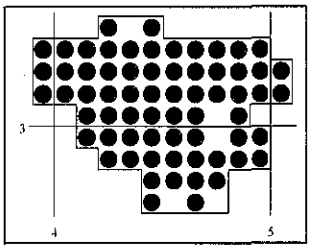
The Forest is centred on two main massifs, one around Wych Cross and the other from Camp Hill to Gill's Lap, separated by the lower ground of the Millbrook valley. The land rises from about 50 m along the southern edge to 220 m at Black Hill. The north side drains down to the Medway Valley and is predominantly north-facing, quite steep

slopes, dissected by numerous small valleys with springs. The south side has gentler slopes and drains to the River Ouse. 1-km square maps showing the topography are as follows:

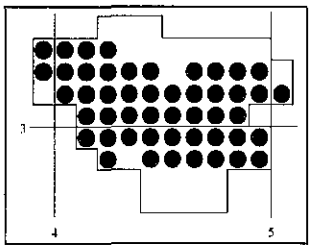
Land less than 100 m altitude



Land 100-150 m altitude



Land above 150 m altitude



The land less than 100 m and more than 150 m is most simple to relate to the species distribution maps, not necessarily because differences in altitudes *per se* are especially significant for plant growth, but for the other factors related to them such as presence of rivers and alluvium.

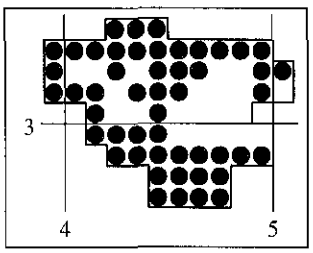
The soils of the area have been described by the Soil Survey (1983) and Jarvis *et al.* (1984), but the map is very general. Ashdown Forest has also been mapped in more detail by Abbas (1979) but his maps are difficult to make sense of in the field.

Poundgate Association soils are the principal soil association in Ashdown Forest, characterised by very acid podzolised soils. On the gentle slopes of the ridge the dominant soils are the Poundgate series which are water-logged gley-podzols consisting of very fine sandy or silty upper horizons differentiated by podzolization from slowly permeable gleyed silty horizons below. These containing abundant sandstone fragments, which in turn rest on interbedded siltstone and sandstone. Cranbrook series soils are deep, silty typical water-logged gley soils which occur on the lower slopes. Ashdown series, water-logged gley soils with an organic surface horizon over gleyed loamy horizons, are characteristic of wet heathland on the lower slopes and around the numerous springs and flushes.

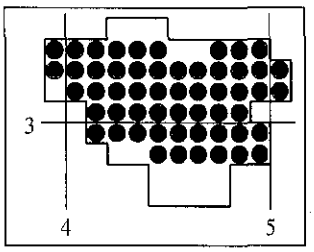
Shallow Curtisden Association soils occur principally on soft Cretaceous siltstones and sandstones in the High Weald and on Jurassic rocks in western England. They are silty water-logged gleyic soils or sandy brown earths and have slowly permeable compact subsoils which cause seasonal water-logging. On the Forest moderately deep examples occur along the northern wooded slopes, and interspersed amongst the Poundgate and Cranbrook series elsewhere, and they are widespread along the southern edge.

Wickham 1 Association soils are restricted to the Weald. They are typical water-logged gleys with fine silty topsoils which are seasonally water-logged and grey and ochreous-mottled. They occur at Coleman's Hatch and around Fairwarp.

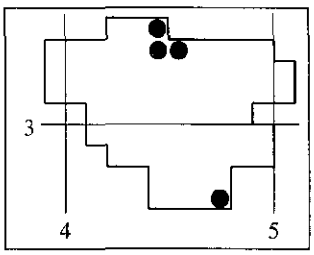
Curtisden soils



Poundgate soils



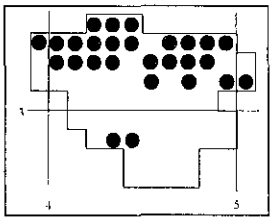
Wickham 1 soils



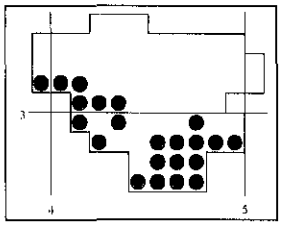
Aspect

The predominant direction faced by the land is shown in the maps below. The main distinction for plants is between north- and south-facing slopes which usually differ in temperature by about 2°C.

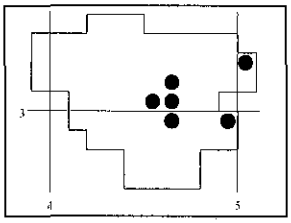
North-facing



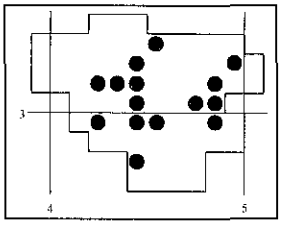
South-facing



West-facing



East-facing



Climate

Climate is one of the main factors determining plant distribution on a large scale. The climate of the Forest is generally similar to that of the Weald in general - mild and damp - and within our small area may be responsible for some plants occurring mainly on north- or south-facing slopes. The dampness is also responsible for the occurrence of some species more widespread in western Atlantic areas such as *Hymenophyllum tunbrigense*.

Temperature obviously varies from year to year. Whilst aspect and slope are important, compared with Sussex as a whole, the Forest suffers from later frosts in the spring, has higher soil temperatures and greater insolation and transpiration over precipitation figures. Mean temperatures are about 3-4°C for January and about 15-16°C for July (the 1995 minimum was -4.5°C and the maximum 31.5°C).

Rainfall is quite high with rain falling on approximately one in every three days. The mean 28-year average rainfall figures are:

MONTH	RAINFALL (MM)	MONTH	RAINFALL (MM)
January	93.2	July	55.5
February	55.9	August	57.4
March	64.1	September	81.4
April	56.0	October	81.8
May	52.1	November	88.3
June	58.1	December	91.2
		Total	835

Data collected in 1992 by J. Calloway (report in Ashdown Forest archive) reveals something of the precipitation chemistry. The pH ranged from 4.6 to 6.6; south-westerly winds carried sodium from sea spray, south-easterly winds carried nitrates from western Europe and westerly winds carried nitrates from English sources.

Ecology and management of habitats

Woodland and scrub

Roughly 40% of the Forest is managed as woodland of various types.

The *East Sussex Inventory of Ancient Woodland* (Whitbread, Barton & Hutton 1989) shows many areas of 'ancient woodland' on the Forest (defined as having had a continuous woodland cover since at least 1600 AD and having only been cleared for underwood or timber production). However, it is likely that there is relatively little woodland older than 300 years (the time of the first enclosures) within the ancient pale, though individual trees may be older. Ancient woodland occurs particularly in areas of the Forest which were enclosed by the 1693 Duchy Decree, such as Broadstone Warren, Hindleap Warren and Pippingford. The old woodland areas also correlate with the Wadhurst clay soils, which would have been more difficult to cultivate outside the forest. Much ancient woodland has been replanted.

Ghyll woods established in the stream valleys where the alluvial soils and damp environment, plus the inaccessibility to cutters, are also suitable for tree growth. The older woods are characterised by *Quercus robur, Fraxinus excelsior, Acer campestre* and with a little *Betula*. *Fagus* may occur in some areas but woods at Legsheath and Five Hundred Acre Wood were devastated by the great storm of 1987. *Carpinus betulus* occurs as coppice in Fairwarp and as an old hedgerow tree in the Chelwood Vachery boundary. *Acer pseudoplatanus* is not too common on the Forest but is invasive in some places as near Chelwood Gate cricket ground. The shrub layer is often dominated by *Ilex*, which can also become invasive, and all too often there is spreading *Prunus laurocerasus* and *Rhododendron*. Management within these areas is restricted to that required for public safety or removing invasive aliens. Any replanting is rapidly overtaken by natural regeneration of *Betula*.

The best area of alder carr is found at Newbridge, though locally small stands also occur elsewhere. They are characterised by large, old *Alnus* coppice stools over *Carex paniculata* and *Chrysosplenium oppositifolium*, and occasional specialities such as *Thelypteris palustris*. The alder woodland at Newbridge has been brought back into a coppice cycle since 1993 and coups will be cut every 15 years.

Semi-natural secondary woodland is common around the Forest. Much has arisen through colonisation of degenerating heathland by *Quercus* and *Betula* scrub, and is botanically poor. The scrubby areas retain their heathland flora for a few years until the light-loving plants become shaded out (*Vaccinium myrtillus* is perhaps the most shade-tolerant of the heathland plants), although a heather seedbank remains. Once the heathland interest has been lost, the area is managed as woodland and in most cases, no work is undertaken. However, in an attempt to produce a long term crop of saleable oak, selective thinning has taken place in woodland near Chuck Hatch. In the wet areas, *Salix* species will also be a component, or, if nutrient status is higher, *Alnus*.

Hazel coppice under *Quercus* standards occurs mainly on soils derived from Wadhurst clay, such as at Cackle Street and Priory Road. The worked coppice at the former has a relatively rich flora with *Orchis mascula* and *Ruscus*, as well as more common woodland species such as *Anemone* and *Hyacinthoides non-scripta*. *Rubus fruticosus* agg. is a component of the 'open' phase of the cycle. *Corylus* is worked on a roughly 12 year coppice rotation in Cackle Street to promote the woodland flora and fauna cycles (there is generally no saleable coppice product but the thinning of the oak standards gives some return). The Priory Road hazel is no longer coppiced.

Castanea sativa coppice occurs quite widely around the Forest. It is generally botanically poor but some plants such as *Wahlenbergia* may appear when they are cleared, for a period until the canopy closes over again. The long-term stability of the system has also produced an interesting Bryophyte flora. *Castanea* coppice near Garden Hill is now being brought back into a worked cycle of some 15 to 20 years; the chestnut stakes are saleable as fencing or charcoal burning material or used for heating the Forest Visitor Centre.

Softwood commercial plantations occur within the flora area. As far as the Forest is concerned, the self-sown pine woods are brashed to reduce fire risk and cleared if there is still good adjacent heathland. In the future, saleable timber will be marketed.

Scrub composed of *Betula, Salix, Pinus sylvestris, Frangula, Ilex* and other woody species is widespread on the Forest and typically invades the heathlands; the most invasive species are *Betula* and *Pinus*. Of the two, *Pinus* is by far the less damaging as it does not coppice from the cut stool, small trees are cut and sold as Christmas trees (this market represented an income of about £3000 in 1994), and the leaf litter does not rapidly 'improve' the soil and reduce suitability for heather growth. Heather can still be found growing under pines which are seventy years old.

Betula invasion is very damaging to heathland. *Betula* species produce huge quantities of seed, which reach every part of the Forest. The leaf litter it produces breaks down quickly and increases soil fertility. This, combined with the nutrient mixing effect caused by the roots, makes the ground unsuitable for growth of *Calluna* after only perhaps fifteen years. This exacerbates the second problem, which is the market value of the birch; birch wood makes excellent firewood and is sought after for turnery for household products such as brush-heads, banisters and wooden spoons. However, by the time the tree is large enough to be used it has already changed the soil conditions too much for easy heathland recovery. Scrub birch is used for besoms and has been used as tied faggots under roads; traditionally tree seedlings would have been controlled by grazing stock.

On the Forest today, many hectares of scrub are cleared every year. It is disheartening work; the small trees are cut and removed and the stump is treated with a herbicide (Timbrel) to prevent regrowth. If the scrub being cut is five years old, the huge seed source means that in five years time it will be back in the same state.

Gorse scrub

Ulex europaeus scrub occurs wherever the soil has been disturbed; good examples can be found at Greenwood Gate over the underground reservoir, along the pipeline from Beaconsfield Road across Millbrook and by ditches and roadsides. It needs managing when it becomes over-tall as it is a fire risk and it tends to lose some of its wildlife value as it becomes too leggy. Many of the invertebrates which use gorse do so because of its 'architecture' which provides many supports for webs and nests. Different species use the gorse at different ages but in terms of numbers, it appears that there are more species associated with denser, shorter stands than the taller plants. Dartford warblers, one of the very few species which merit special treatment on the Forest, seem to prefer gorse about 1 metre high in thick heather.

Heathland

Several separate vegetation types make up the heathland habitat. On the Forest these vary from pure *Calluna* through to pure *Pteridium*. The biggest patches of *Calluna*-dominated dry heath occur on the Forest ridges from Camp Hill, through Kings Standing to Gills Lap. Other blocks can be found in the dry areas of the Old Airstrip and at Broadstone. There may be a lichen/moss ground flora. *Erica cinerea* often appears where the ground has been disturbed and a free draining 'edge' has been created. Where the ground becomes wetter, *E. tetralix* will be found, frequently with increasing amounts of *Molinia*. If the area has been over-burnt, bracken is likely to be found on the dry ground and *Molinia* in the wet.

Management of *Calluna* on the Forest aims to maintain a variable-aged mosaic within each particular stand; this is achieved by cutting with a forage harvester and removing the collected litter to prevent mulching. Experience has shown that cutting *Calluna* in the building/mature phases leads to rapid recovery from the root-stock and little invasion from grasses or bracken. Cutting *Calluna* in the senescent phase means a longer recovery period and can allow establishment of grasses, particularly *Molinia*, but there is some evidence that the grasses will be shaded out when the heather achieves a closed canopy. The Forest aims to cut about 4 hectares of mid-age *Calluna* each year on a fifteen year cycle. Much of the *Calluna* on the Forest is approaching the senescence phase and grows on uneven ground which is inaccessible to tractors; rejuvenation will depend on layering or seed recruitment; neither of these are thought to be common on the Forest. In 1961, the Sussex Naturalists' Trust reported that there was very little mature heather on the forest. Due to the removal of grazing we have the opposite problem now.

Old photographs (and the activities of the Commoners) show that the Forest may have been much more grass-dominated than the present large heather blocks suggest. Acidic grassland has a high wildlife value and some areas are being reclaimed from bracken invasion by mowing (these often convert to *Deschampsia flexuosa*), this has a lower fire risk and a higher amenity value for picnics and playing games.

Molinia caerulea covers large areas in the wetter valleys on the Forest where the water table is high. It is spreading at the expense of heather (suggestions that this is caused by eutrophication due to dissolved nitrates in rainfall have yet to be proved by experiment). Where there is a recent history of grazing, marsh gentians may still be present in good numbers. Tall, clumpy *Molinia* bogs are a good habitat for several invertebrates, including the great raft spider *Dolomedes fimbriatus* and two species of Odonata. Several small mammals (shrews, mice and voles) are also likely to be found on rank grassland.

Management of these areas is minimal. Due to the success of the bracken stripping in producing new heather areas, in 1995 a small area of *Molinia* turf was removed to attempt to introduce a heather community. This simulates the 'turbary' or turfing for fuel which used to be carried out on the Forest. Due to the expense of the operation (about £200 to clear 150 square metres) this will be impractical for large scale use unless there is a market for the mulch as a soil improver.

Marsh and bogs

One of the most beautiful sights on the forest must be the splashes of yellow *Narthecium ossifragum* in August. These are often on rides where the vegetation is short, with a range of species such as *Rhynchospora alba* and *Trichophorum caespitosa* giving a range of colours. The old ride east of the Radio Station is a particularly good example of this.

Near the bottom of all the non-wooded valleys of the Forest, the increasing water levels give rise to *Molinia* bogs which drain into the streams. Ungrazed *Molinia* clumps form deep (1 metre plus), inaccessible bogs whose shade and vigour prevent many other species surviving. Where these have been grazed at Millbrook, the cattle break down the clumps and *Menyanthes, Anagallis tenella* and other interesting species have appeared.

Where the *Molinia* has failed to achieve its 'tussock' form, several other species are characteristic. One of the best sites is along the Old Lodge boundary where among the *Molinia* can be found several *Sphagnum* species, *Drosera* species, *Cirsium dissectum, Rhynchospora* and *Dactylorhiza incarnata*.

Meadows and grassland

The Forest has few meadows of interest within it, but around the edges the occasional species-rich hay meadow can be found with *Genista tinctoria, Centaurea nigra* and *Lathyrus pratensis*. Most of the meadows within the pale are heavily grazed *Lolium perenne - Cynosurus cristatus* swards, and support few or no species of interest.

Stream and rivers

Other than the Medway and Millbrook, most of our streams are either small and dry in summer, or shaded, and lack aquatic vegetation. The Medway is the largest river in the flora area and has aquatic plants such as *Nuphar lutea* and *Callitriche* and the few open stretches of Millbrook have *Ranunculus peltatus* and *Sparganium emersum.*

Ponds and lakes

There are a few large lakes in the Forest such as in Pippingford Park, Boringwheel Mill and Old Mill Farm. The vegetation present is variable, some with *Menyanthes trifoliata, Potamogeton natans* and *Eleogiton fluitans*, and others with *Typha* and *Nymphaea alba*. Some of the smaller ones have more marginal vegetation with species such as *Sparganium erectum* and *Carex riparia*, others which dry out in summer may have plants such as *Ranunculus peltatus* and *Callitriche* species. The two alien species, *Crassula helmsii* and *Myriophyllum aquaticum,* are currently spreading and could take over some ponds.

Open bog pools are not common on the Forest but they are often quite rich. In Pippingford Park some have been created by explosives. Typically, they will have submerged *Sphagnum* species, *Eriophorum angustifolium, Hypericum elodes* and *Narthecium*. These provide particularly good habitats for Odonata, including the small red damselfly (*Ceriagrion tenellum*).

Villages and other habitation

The villages have their share of escaped garden plants, weeds and casuals, and have a completely different flora to the rest of the Forest. Near houses, gardon plants are often thrown out onto rubbish piles and sometimes establish. The local churchyards often have a range of species with ferns on the walls, *Leontodon hispidus* and *Leucanthemum vulgare*. The playing fields created from the Forest grasslands can be quite rich with good swards of *Agrostis* species, *Nardus stricta* or *Danthonia decumbens*: Fords Green even has *Chamaemelum nobile*. The disused railway at Forest Row is largely over-grown with scrub but still has some open patches with typical railway species such as *Chaenorhinum minus*.

The golf courses tend to have improved fairways, though acid grassland survives on the roughs. They also have heathy patches and scrub, but the boggy areas have mostly been drained and the areas are generally impoverished compared to what they would have been as heath. However, some rarities such as *Cicendia* occur only on the golf courses and other plants including *Anagallis tenella* are widespread there.

Roads, verges, tracks and car parks

Road verges support a distinctive neutral to calcareous grassland flora which differs markedly from the acidic heaths adjacent. This is largely due to the input of limestone dust from the road chippings onto the verges which raises the pH often to 6.5-8.0. The flora is typically composed of species such as *Galium verum, Pimpinella saxifraga, Medicago lupulina* and many grasses, and even some calcicoles such as *Bromopsis erecta* and *Filipendula vulgaris* can be frequent.

There are some eighty miles of rides and tracks on the Forest. Visitors like to think that they are there for their benefit, but their primary function is to facilitate fire control. They act as fire-breaks (though they will only stop a small fire), they can be used to allow 'back-burning', which effectively increases the width of the fire break, and they give improved vehicle access for fire fighting. Management involves once-a-year mowing, carried out in the autumn after flowering; this takes one tractor nearly two months. To maintain access it is also necessary to ditch and drain the main fire-rides. Where grazing has been re-introduced, mowing is not necessary because the stock enjoy the good grass on the rides.

The rides are important wildlife sites because the mowing effectively simulates grazing where there is no stock. Species such as the silver-studded blue butterfly are found almost exclusively on the rides. Plant species which cannot cope with rank competition also like the short growth. These include *Dactylorhiza maculata, Euphrasia* species, *Salix repens, Nardus stricta, Pedicularis sylvatica, Danthonia decumbens* and sometimes *Gentiana pneumonanthe*. Boggy rides, though inconvenient for walkers, also have some interesting species such as *Drosera rotundifolia, D. intermedia* and *Rhynchospora*.

Hedges

The Forest Pale is largely covered by trees and is poor in hedgerow species. Many sections are dominated by *Fagus sylvatica* or *Quercus robur*.

The older hedges and hedgebanks around the outside of the Forest are often richer, with up to four *Rosa* species, *Ilex aquifolium, Crataegus monogyna, Corylus avellana*, and other woody species. The hedges around the smaller recent intakes in the Forest are generally poor though of similar composition.

Arable

Arable land around the Forest is very uncommon and rarely has many weeds. *Kickxia elatine* has been found in one field and the organic farm at Plaw Hatch has abundant *Chenopodium* species.

Other aspects of management

Grazing is clearly one of the three fundamental activities which form and sustain heathland (with cutting and, possibly, burning). The effect of grazing is to prevent succession to woodland from occurring; it reduces fertility, slows or halts ageing of vegetation and introduces structural and age mosaics (due to the different palatability of species). It is the opinion of many (or all?) managers that grazing is essential to produce sustainable, quality lowland heathland; all other management techniques can only be considered as 'holding action' until grazing can be re-introduced (the exception being the coastal heaths where the heathland may be the climax vegetation).

As far as the Forest is concerned, 200 acres are enclosed and grazed at present. Permission has been granted by the Secretary of State for the Environment to fence a further 1100 acres. There are Commoners who want to continue to graze stock on the Forest but the traffic speed and volume do not allow safe grazing on unenclosed land.

There are old records of customary tenants (later Commoners) being granted permission to burn the Forest to improve the grazing. There is certainly a recent (last fifty years) tradition of burning to provide 'early bite' grass recovery for stock. There is, however, much controversy as to whether or not the Forest was burned when the Commoners were at their peak. The argument against is that there were certainly too many Commoners for the produce of the Forest and that burning would actually destroy many of the things they sought - bracken, firewood, mature heather for thatching, gorse for firewood etc. It seems likely that burning only became necessary with the decline of the Commoners as the Forest began to grow up. Controlled burning is not used on the Forest for several reasons: it is not compatible with the campaign waged to avoid arson or public carelessness causing wildfires; it is not environmentally acceptable (take straw-burning); it is difficult to predict the effect on the recovering vegetation (often an increase in bracken); it has a devastating effect on invertebrates, small mammals and reptiles. It is important to realise that if burning is contemplated, it must be part of a complete system of grazing and cutting, and not used as a panacea for heathland problems (reducing fertility, killing scrub and coppicing heather).

The main aliens which are controlled are *Fallopia, Rhododendron* and *Gaultheria*, which have fortunately not reached the epidemic proportions which can be observed in other areas of the country. Where they do occur, they are removed by digging out the whole plant or spot spraying.

Conservation

Ashdown Forest is the largest continuous block of heath, semi-natural woodland and valley bog in south-east England. Heathland is an internationally important and declining habitat, and as a Site of Special Scientific Interest (SSSI), the Forest is of national nature conservation importance: The SSSI schedule mentions a range of species of note, including *Lycopodiella inundata, Wahlenbergia hederacea* and *Gentiana pneumonanthe*. The wetland habitats are important for bog bush crickets and small red damselflies, and mown rides provide habitat for silver-studded blue butterflies, while the hazel coppice has a population of dormice, another declining species (protected under the Wildlife and Countryside Act 1981). Perhaps more importantly, the Forest has recently been designated a Special Protection Area (SPA) for birds. This is due to the fact that a significant percentage of the British populations of Dartford Warbler and Nightjar nest here (the numbers fluctuate from year to year), as well as there being regular visits from great grey shrike, hen harrier and woodlark. Each species has their own habitat preferences, and in most cases it is not considered necessary to manage habitats solely for a particular rarity. However, once it is known which species are present and their habitat preferences, the Rangers are usually keen to ensure that suitable management is undertaken. Coppicing of the hazel to provide continuous dormouse habitat; fencing marsh gentians within the grazed area to allow them to flower and cutting the gorse to ensure that there is thick, dense nesting habitat are all important conservation tasks. In general, however, the aim is to manage the Forest to provide the mix of heathland and woodland habitats which have become available over thousands of years. The plants and animals which have evolved to live in these situations would be unable to adapt to large scale changes in habitat which occur without management. Reptiles and invertebrates which require open heath would be lost from areas allowed to scrub over and become woodland in a matter of decades.

Botanically, the Forest area is (or was) home to about 900 species and hybrids. Nearly 50 (6%) of these species are native plants endemic to the United Kingdom or Europe (excluding *Taraxacum* for which there is no clear information), though some are already extinct:

Aira praecox	Possibly a European endemic
Callitriche hamulata	Possibly a European endemic
Callitriche platycarpa	Possibly a European endemic
Carex laevigata	Western European endemic
Carex pilulifera	European endemic
Carex pulicaris	European endemic
Centaurea nigra	European endemic
Ceratocapnos claviculata subsp. *claviculata*	European endemic
Cirsium dissectum	European endemic

Conopodium majus	Western European endemic
Crataegus laevigata	European endemic
Dactylorhiza praetermissa	European endemic
Epipactis purpurata	European endemic
Erica tetralix	European endemic
Euphrasia anglica	Possibly a UK endemic
Euphrasia nemorosa	European endemic
Fagus sylvatica	Our ssp. is a European endemic
Hyacinthoides non-scripta	European endemic
Hypericum elodes	European endemic
Hypericum pulchrum	North-western European endemic
Luzula congesta	European endemic
Narcissus pseudonarcissus subsp. *pseudonarcissus*	European endemic
Narthecium ossifragum	European endemic
Pedicularis sylvatica subsp. *sylvatica*	European endemic
Pilularia globulifera	European endemic
Potentilla sterilis	European endemic
Ranunculus hederaceus	European endemic
Rubus armipotens	UK endemic
Rubus arrheniiformis	European endemic
Rubus brevistaminosus	UK endemic
Rubus cissburiensis	UK endemic
Rubus decussatus	UK endemic
Rubus fissus	UK endemic
Rubus hastiformis	UK endemic
Rubus leucostachys	UK endemic
Rubus subinermoides	UK endemic
Rubus surrejanus	UK endemic
Rubus trichodes	UK endemic
Salix cinerea subsp. *oleifolia*	Western European endemic
Salix repens	Possibly European endemic
Scutellaria minor	Western European endemic
Teucrium scorodonia	European endemic
Ulex gallii	Western European endemic
Ulex minor	Western European endemic
Ulmus procera	UK endemic
Viola lactea	Western European endemic
Wahlenbergia hederacea	Western European endemic

The following 62 species (7.3%) which are likely to be native have been recorded in the past from the Forest but have not been refound (many introduced species have also not been refound). Most are classic wet heath, dry heath or acidic grassland species, indicating that changes in the habitats are probably the cause (see for example Paltes 2, 6 and 7). They are presumed to no longer occur on Ashdown Forest (except some *Rubus* species which could be over-looked), but we hope that some will be refound.

Alchemilla glabra
Alopecurus aequalis
Anthemis arvensis
Apium inundatum
Bidens tripartita
Botrychium lunaria
Bromus lepidus
Carex rostrata?
Carex strigosa
Carlina vulgaris
Dactylorhiza praetermissa
Damasonium alisma
Daucus carota
Eleocharis quinqueflora
Equisetum telmateia
Eriophorum vaginatum
Filago vulgaris
Fumaria bastardii
Fumaria officinalis
Gentianella species
Genista pilosa
Gnaphalium sylvaticum
Hammarbya paludosa
Huperzia selago
Iris foetidissima
Jasione montana
Juniperus communis
Knautia arvensis
Lycopodium clavatum
Mentha pulegium
Moenchia erecta
Myosurus minimus
Oenanthe aquatica
Orobanche minor
Pedicularis palustris
Persicaria minor
Pilularia globulifera
Pinguicula vulgaris
Pseudorchis albida
Pyrola rotundifolia
Ranunculus hederaceus
Rosa obtusifolia
Rubus arrheniiformis
Rubus caesius
Rubus conjungens
Rubus fissus
Rubus lindleianus
Rubus murrayi
Rubus platyacanthus
Rubus sulcatus?
Rubus wedgewoodiae?
Sagina subulata
Sagittaria sagittifolia
Salix triandra
Scleranthus annuus
Sorbus torminalis
Trifolium arvense
Triglochin palustris
Ulex gallii
Vaccinium oxycoccos
Veronica anagallis-aquatica
Viola lactea

SOURCES OF INFORMATION AND METHODS

Historical records

There are many unpublished documentary sources held in the Public Records Office and the County Records Office dating from 1274 onwards which contain brief references to plants and their uses, but these have not been abstracted systematically. We are aware of a number of other references which have not yet been traced.

1. Literature

Although there are a number of unpublished manuscript records for species such as beech and bracken on Ashdown Forest, the earliest published records traced are for a few rare species in Turner & Dillwyn's (1805) Botanist's Guide.

Forster (1816) published eleven localised records in his *Flora Tonbridgensis*, all original and accurate with the possible exception of *Triglochin palustris*.

Cooper (1835) provided more early records from the Forest, with a few interesting comments "*Pine, fir, beech and birch all grow very well in this district, and the two Forests just mentioned [Ashdown and St. Leonard's] have been planted with them with great success*". His list of 'forest' plants is of woodland plants, but there are a few specific records, some of which are repeated from earlier sources, especially Turner & Dillwyn (1805).

In 1836, W. H. Coleman spent six months at Saint Hill, East Grinstead and recorded plants within a radius of four miles (Rich 1994a). Although Coleman was probably aged only about twenty at the time, the list is both comprehensive and accurate. He appears to have visited the Forest on a number of occasions, and specifically noted 51 species, some with detailed localities. Among the most interesting records are *Carlina vulgaris, Filago minima, Sagina subulata* and *Vaccinium oxycoccos*.

Jenner's (1845) flora of Tunbridge Wells drew heavily on Forster's flora, and most records were copied directly, adding little new.

Deakin (1871) noted many plants from the "forest", "Forest", and "Forests" in his flora of Tunbridge Wells, which may refer to any combination of Ashdown, Broadwater and Waterdown Forests. Only records specifically from Ashdown Forest have been abstracted, though it is quite clear that some plants were known to be widespread on all three. Many of the records are original.

Hemsley (1875) provided three localised records in his outline of the flora of Sussex.

The first reasonably comprehensive *Flora of Sussex* was published by Arnold (1887), with records for Ashdown Forest mainly included in District VII Medway, but some also in District IV Ouse. Arnold relied heavily on Jenner's lists from Tunbridge Wells area, and also on Coleman's (1836) list. Definite localities from within the Forest area have been abstracted. Many species are described as common in District VII as a whole, and others simply noted from Withyham or Maresfield are too imprecise to be included. The second edition (Arnold 1907) contains a few extra records.

Boys Firmin (1890) included a list of the wild flowers from Crowborough compiled by Miss Rusher, though many of the commonest flowers were omitted. Eleven species were recorded from the Forest.

William Whitwell (1902) recorded plants during three visits to the Horsted Keynes area between 1899 and 1900. There are nine specific records, all probably from the west side of the Forest.

Croydon Natural History and Scientific Society visited Ashdown Forest on 26 June 1902, the Coronation day of Edward VII (Clark 1903). The list of plants recorded includes records from West Hoathly, Brambletye, Ashdown Forest and East Grinstead. Insufficient details were given to locate most of the plants definitely within the Forest, but heath species such as *Huperzia selago, Lycopodium clavatum* and *Genista anglica* almost certainly were.

Isaac Wells gave a talk on the flora of Ashdown Forest in 1915 (Wells 1916), but did not mention any specific localities. He first became acquainted with Ashdown Forest in 1860 and was attracted by the numerous ferns growing in quantity. By 1915 the ferns were described as "somewhat rare now", and he ended with a plea for their conservation.

Wolley-Dod's *Flora of Sussex* (1937), the second major Sussex flora, included a critical review of the old records, mostly from the original manuscripts, and as he was so thorough, the original sources have not been re-investigated. There are many detailed records from both the Forest and surrounding land; these have been abstracted reasonably systematically, though it is difficult to decide how many records for places such as Hartfield, Maresfield or Crowborough should be included as their parishes go right up onto the Forest.

Ingwersen (1951) gave records for *Myrica* and *Osmunda* from the Forest, but neither fits with the other records and he is probably quoting from hearsay rather than personal knowledge; neither record is accepted.

The next major set of records was collected for the *Sussex Plant Atlas* between 1966 and 1978 (Hall 1980). The records are mainly given as tetrad (2 km x 2 km square) maps, with the occasional locality cited for rarer species. Records have been abstracted if any part of the tetrad occurred within the study area, though it is likely that some of the records are from outside the area. Tetrad records additional to the *Sussex Plant Atlas* were given by Briggs (1990); these include both pre- and post-1980 records. Again, tetrad records only are included, some of which may be from outside our flora area. The tetrad letters have been converted to the standard BSBI 'DINTY' grid (Ellis 1986) and do not follow those given in Hall or Briggs.

Several PhD theses have been written on the forest, and some information has been abstracted from them. Jenks (1967) carried out a vegetation survey. Abbas (1979) studied the soils. Irons (1982) pulled together much information on the impact of man on the historical ecology.

A few miscellaneous records were given by Marrable in Willard (1989), mainly derived from previous work. *Ashdown Forest News,* produced by the Friends of the Forest, has many useful and interesting articles (a set is held at the Forest Centre). Kent Field Club have visited Ashdown Forest on a number of occasions and records have been abstracted from their Bulletins. A few records have been abstracted from issues of the *Sussex County Magazine*.

Fincham (1995) published a small photographic guide to 107 'more common' flowers of Ashdown Forest, which should be useful for beginners. The main identification errors are *Calamintha ascendens* and *Carum carvi*, and a number of the photographs are incorrectly labelled.

2. Unpublished sources

W. E. P. Done recorded the flora of the area around Groombridge between 1904 and 1914 in a personal diary, now in the possession of the Sussex Botanical Recording Society. Done recorded extensively on the east side of Forest, especially around Crowborough and some of his records from that area may refer to areas outside our study area.

Between 1928 and 1953, George Dent noted many observations of plants and animals on Ashdown Forest in his personal diary, including details of *Genista pilosa* and *Hammarbya paludosa*. The information has been summarised by courtesy of Mrs Phyllis Green who inherited the diary when George died in 1959.

A few records from one of Ron Boniface's notebooks have been included from his visit on 14 August 1948 to Hindleap Warren, Broadstone Warren and the golf course where he gives frequencies for plants which differ markedly from the current situation.

Data for selected 'rare' species were compiled for the Forest by Colin Corfield in 1981/82; these records have been abstracted by Chris Marrable.

Peter Sollars carried out a detailed survey of the parish of Forest Row mainly between 1985 and 1987. He has abstracted details of the more interesting species from his notebooks.

Data held by the Biological Records Centre (BRC), Monks Wood for TQ/4.3 was summarised for the BSBI Monitoring Scheme (Rich & Woodruff 1990), and selected records have been abstracted from the 'historical' pre-1987 records. 1987 and 1988 records collected by the SBRS, DB, and PW & RW have also been abstracted where they could be located to a 1-km square and recording information was available. Additional historical records were abstracted for TQ/4.2 manually but fewer details were available.

3. Herbaria

Records have been extracted from the computer database at the Booth Museum of Natural History, Brighton (**BTN**) by Gerald Legg and Joan Stoddart; where possible, these have been correlated against the literature records. The main collections are of T. Hilton (especially the period 1893-1901) and E. H. Farr (1892-1905).

There are a few collections in Tunbridge Wells Museum and Art Gallery (**TLS**), and data have been extracted from the card index by MM. There are three main collections from the Forest by J. Stirling, L. M. Child and G. E. Shaw (the latter possibly on joint excursions).

The herbarium of Miss Phyllis Stockdale (1898-1949) of East Grinstead (later Mrs Horrill of Eastbourne) is held at Bexhill Museum (**BEX**), and the records have been extracted by RN. The records date mainly 1910-1914, with a few 1916 records, and most are simply labelled East Grinstead, though a few for Ashdown Forest and Forest Row are also noted. She collected many plants from F. J. Hanbury's garden at Brockhurst, and presumably learnt from both him and her father, William Stockdale. Wolley-Dod had also been through and confirmed or corrected the material. A comparison of the notes and records in Wolley-Dod (1937) with the herbarium material indicates that Wolley-Dod must have talked directly to Mrs Horrill and gleaned further information; for instance, the *Drosera intermedia* (*D. longifolia*) specimen in **BEX** is simply labelled East Grinstead whilst the record in Woolley-Dod (1937) reads 'bog near the rifle range, Forest Row'. Individual localities must therefore be treated with caution, but we have attempted to correlate them as far as possible (Rich, Nicholson & Wood 1996).

A few records of selected species have been extracted from material in the cupboards at the Natural History Museum (**BM**), but the remaining 40% of the material in boxes has not been searched, and further work on the Barton & Riddelsdell *Rubus* herbarium is required.

A few records have also been abstracted from the Fielding-Druce herbarium at Oxford (**OXF**).

4. Field survey

The main field survey was carried out from 1993 and 1995. Botanists were asked to record the vascular plants in all the 1-km squares covering the Forest area, irrespective of the actual Ashdown Forest boundary. They were asked to visit as many different squares as possible rather than concentrate on one area. Field meetings were organised with the Flora group once or twice each month during the summer to help with plant identification (five in 1993, ten in 1994 and thirteen in 1995). There was no need to direct recorders at this stage to different areas as they largely tended to select different routes (Rich & Smith 1996).

The record cards used were the SBRS ones which are designed to collect recording information (Appendix 1), and in particular the time spent recording was requested. A check was kept on which habitats had been recorded, and un-recorded ones were visited later. Several spring surveys were carried in 1994 and 1995 to look for early-flowering species. Experts were called in to help with the large critical genera, *Taraxacum* and *Rubus*, as they simply could not be recorded with local expertise.

A check was kept on time spent recording during the first two years, and then a realistic target - to bring the total time in each 1-km square up to ten hours - was set in 1995. To try to ensure even coverage, botanists were allocated groups of 8-10 squares in 1995 and asked to co-ordinate the recording. Recorders were also supplied with lists of 'common' species which were missing from the squares. This drew attention to plants like *Betula* or *Ulex* which had not been noted. Lists of missing species which had been recorded in the tetrads by Hall (1980) were also circulated which helped to refind some plants. Special searches were made for some species such as *Genista pilosa*.

An incomplete list of the historical records was circulated in February 1994. Draft maps of the 1993/1994 data were circulated in March 1995, which also helped to draw attention to the under-recorded areas and erroneous records.

Record cards were sent to TR after each trip or during the winter, and compiled onto master-cards. TR and others checked identification of problem plants, some of which have been deposited in herb. P. A. Harmes. All the field

survey data were then put together and double-checked against the master-cards; this reduced data-processing errors to less than 0.1%. Draft final maps were circulated to all members of the group during the winter of 1995/1996 with requests for details of odd or interesting records. This resulted in a number of additional errors being detected. Detailed local knowledge is essential for assessing the quality of the records. We believe the final data-processing error rate to be very low indeed (no errors were found in a third sample check), and negligible compared to identification errors. For an account of sources of error see Rich & Woodruff (1990, 1992).

A check for completeness of recording was carried out after the recording was finished in October 1995. Lists of the residual missing common species were circulated and a few squares checked for extra species. The numbers of extra species recorded for six squares are shown below:

Square	Hours	Number of extras
43.31	1	0
45.29	2	4
47.30	2	3
47.32	3	5
47.33	0.5	3
48.30	2	9

This indicates that additional records could probably be made in all squares, and we make no claims to have recorded everything (see also the following chapter on analysis of the data). We would welcome extra records.

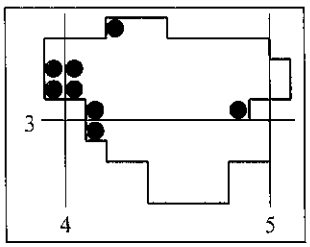
ANALYSIS OF THE FLORA DATA

In this chapter, the information about the recording and environment are presented and then analysed to see how it relates to the species data. Our species data are also compared to the *Sussex Plant Atlas*.

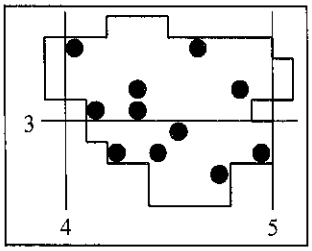
1. Recording and environment data

The following maps show which botanists visited which squares, and indicates the success in getting recorders to visit different areas. We have also had many Flora and SBRS meetings.

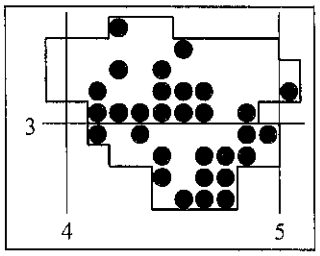
David Bevan (DB)



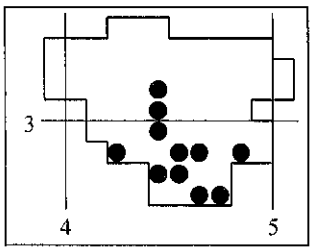
Patrick Coulcher (PC)



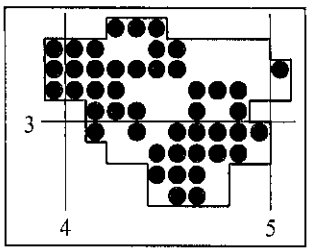
Pat Donovan (PD)



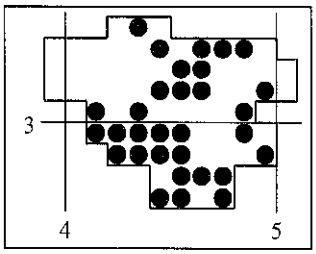
Paul Harmes (PH)



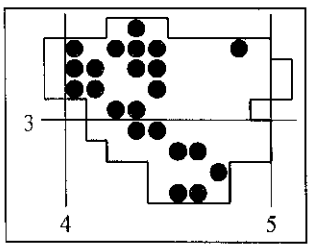
Alan Knapp (AK)



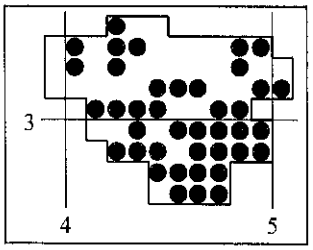
Malcolm McFarlane (MM)



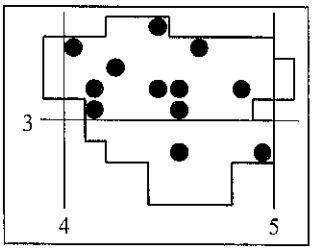
Nicky Muggeridge (NM)



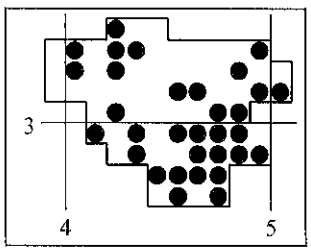
Rachel Nicholson (RN)



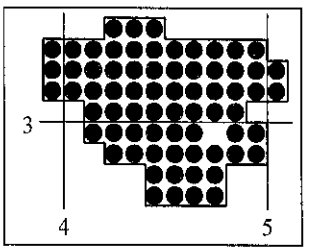
Helen Proctor (HP)



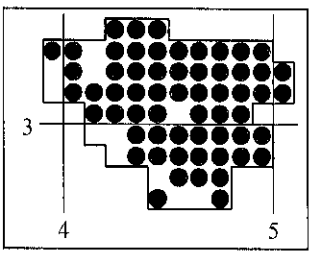
Elizabeth Rich (ER)



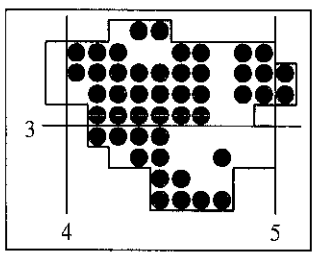
Tim Rich (TR)



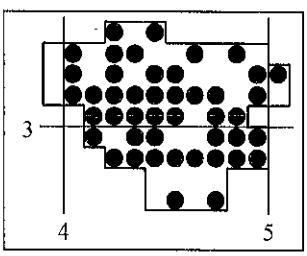
Phyllis White (PW)



Other botanists



Flora meetings



SBRS

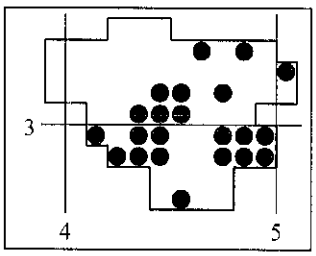


Figure 2. Number of different visits to each square.

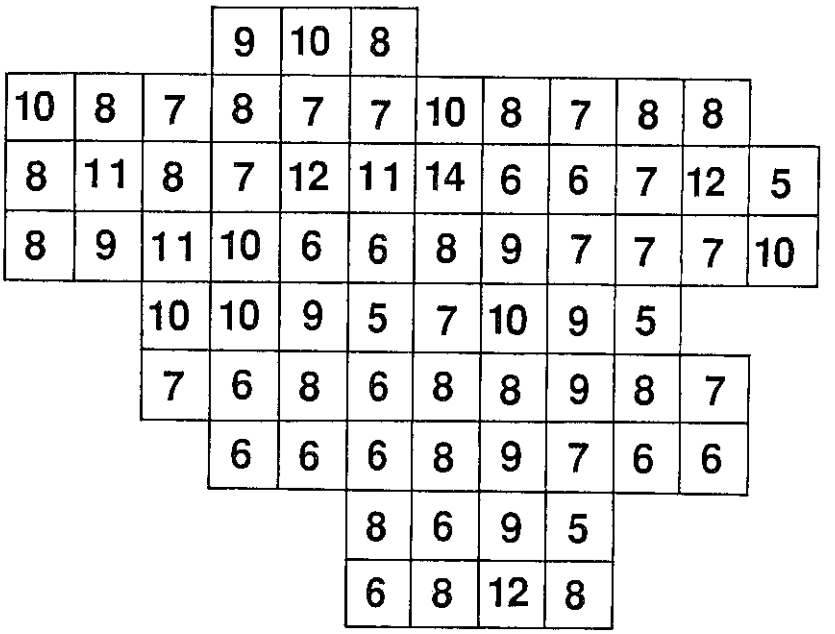
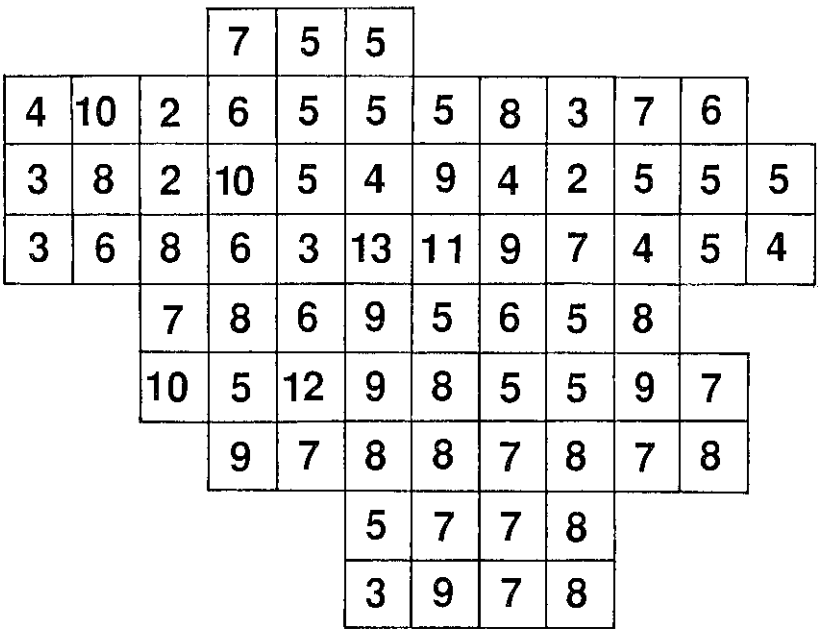


Figure 3. Number of different botanists who visited each square.



The number of different visits to squares (mean 8 visits per square), and the number of different botanists who visited each square (mean 6.5 botanists per square) are shown in Figures 2 and 3 respectively.

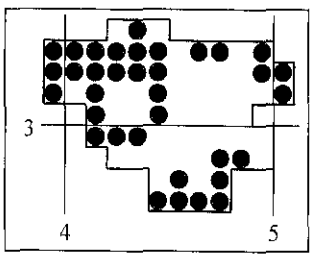
The hours spent recording are shown in Figure 4; we have achieved a reasonably even coverage (mean 11 hours per square). With hindsight the squares 48.32, 49.32 and 49.33, which were recorded as part of tetrad 43W for the BSBI Monitoring Scheme, should have been re-recorded during 1993-1995 as they have had many extra hours of recording above our target of 10 hours.

Figure 4. The number of hours spent recording in each square.

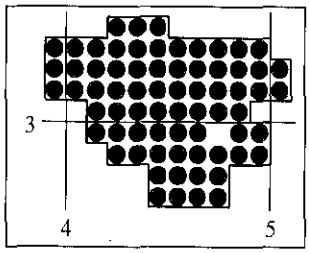
			10	12.5	11						
10	10.5	10	10	10	10	10	10	11.75	10	14.75	
10	12.25	10	10	10	10.5	13	10.5	10	14.5	22.75	10.25
12.5	11.25	10	12	10	10	10	10	10	10	10.75	16.5
		10	10	10	10	10.5	11.25	10	11		
		10.25	10.25	12	11.25	14.5	10.25	10.25	10.5	10	
			10.5	11.5	11.75	10.5	11.75	12.5	11.25	10	
					10.5	10.25	10	10.25			
					10	10	10	10			

Data on the physical environment have been compiled from Ordnance Survey maps, the ancient woodland inventory and field notes (e.g. presence of a pond not marked on the map). The habitats recorded are shown on the following maps, with open circles where they are present but unrecorded (e.g. on private land). The maps show we have been reasonably successful in recording the known habitats in the area; where we have failed has largely been on private land (to which we have not always asked for access).

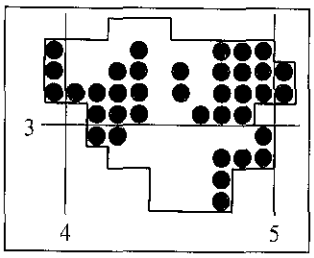
Ancient woodland



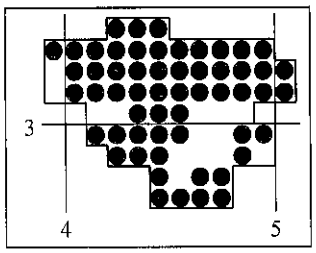
Semi-natural woodland



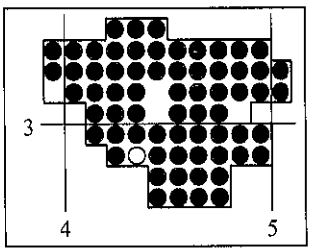
Plantation



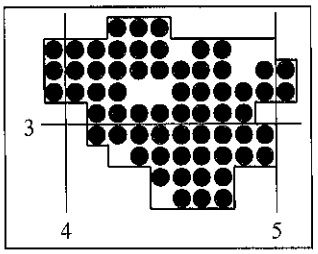
Coppice



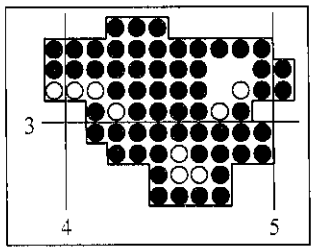
Scrub



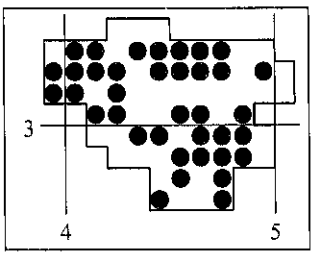
Heathland



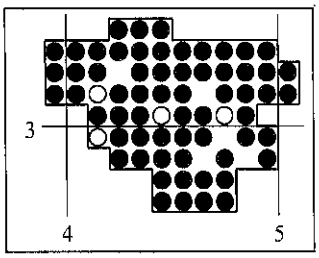
Grassland



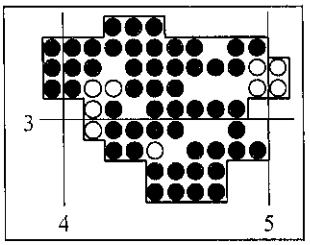
Marsh and bog



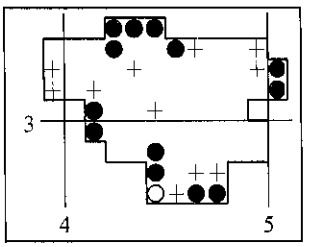
Streams and rivers



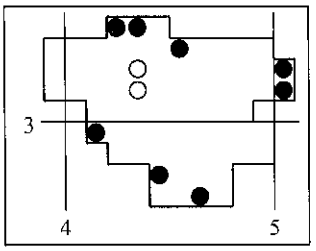
Ponds and lakes



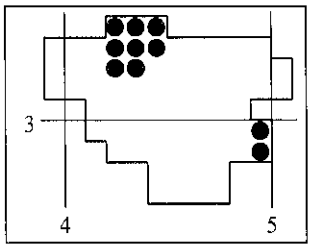
Villages and
other habitation (+)



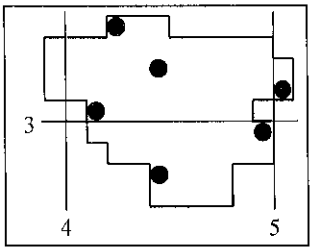
Churchyards



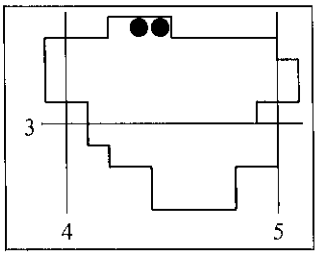
Golf courses



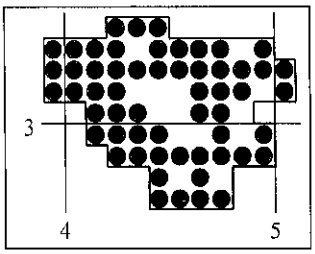
Playing fields



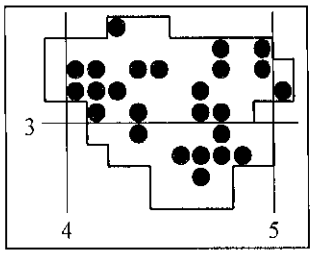
Disused railway



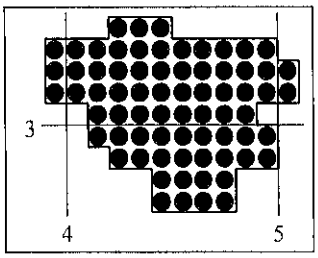
Roads and verges



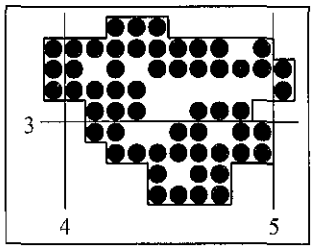
Car parks



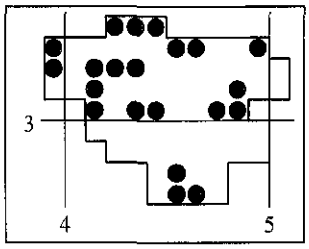
Rides, tracks and firebreaks



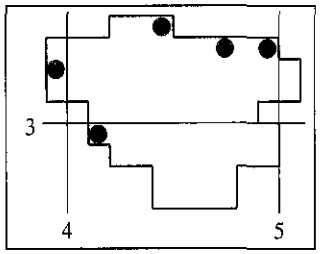
Hedgerows



Disturbed/waste ground



Arable



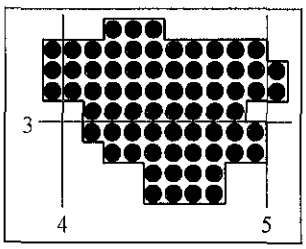
The number of habitats recorded in each square is shown in Figure 5.

Figure 5. Number of habitats recorded in each square.

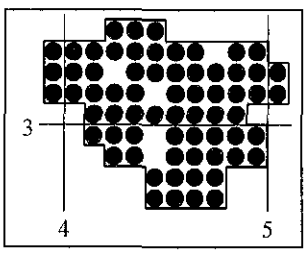
			15	13	14						
11	10	10	12	11	11	12	12	11	7	13	
15	11	12	11	11	13	11	10	11	8	12	10
9	11	10	10	7	6	7	8	7	8	7	14
		13	11	11	7	9	12	10	11		
		9	9	10	9	8	8	7	9	11	
			8	8	10	9	9	10	11	9	
					13	8	11	10			
					10	11	14	13			

We have also ensured comprehensive coverage during the spring and early summer (all early flowering species can still be found easily in June), and visited most squares during peak summer in July and August. Only one square (44.33) was not recorded after July.

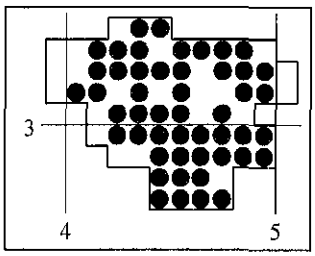
January - June



July - August



September - December



2. Species data

A total of 916 species were recorded in our survey, and the number of species in each square are shown in Figure 6. If the critical species, hybrids, infraspecific taxa and those with known recording bias are excluded, there are 734 species, and the numbers are shown in Figure 7. We have recorded an average of 258 species per 1-km square (241 if critical taxa are excluded).

Figure 6. Total number of species

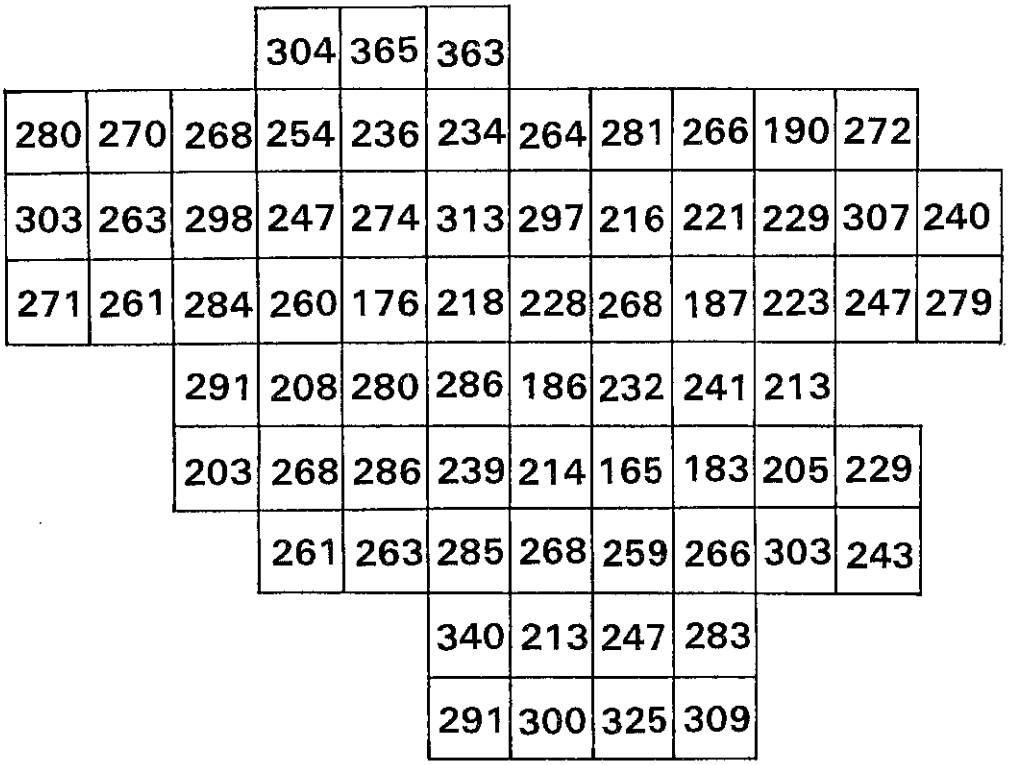
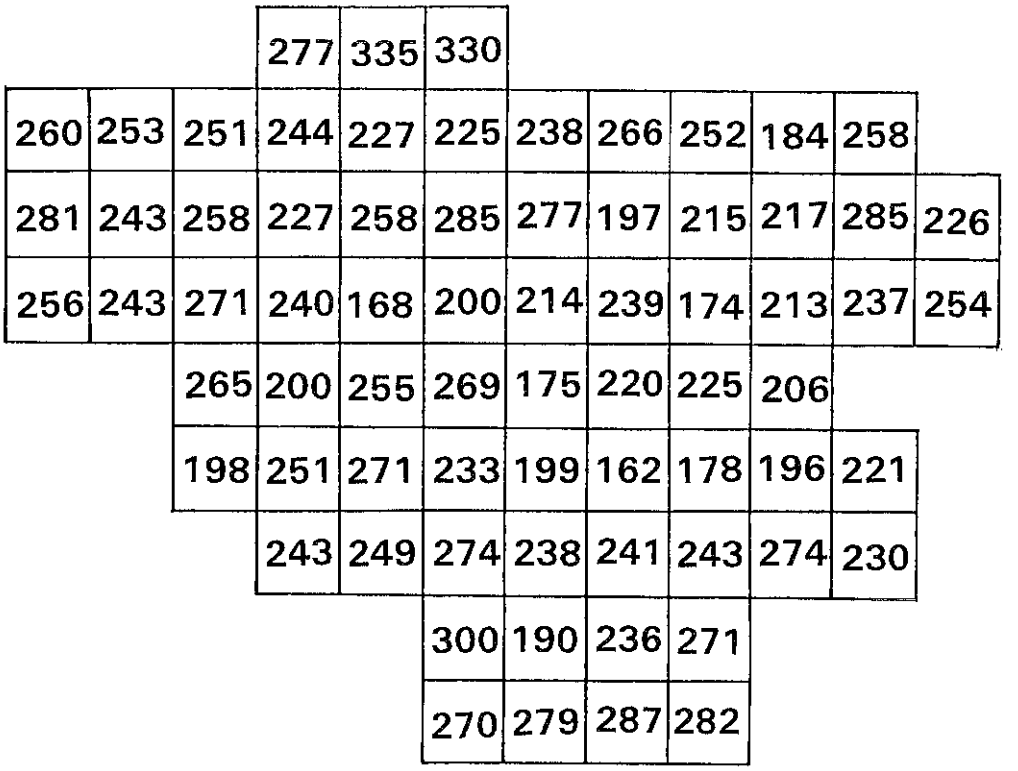
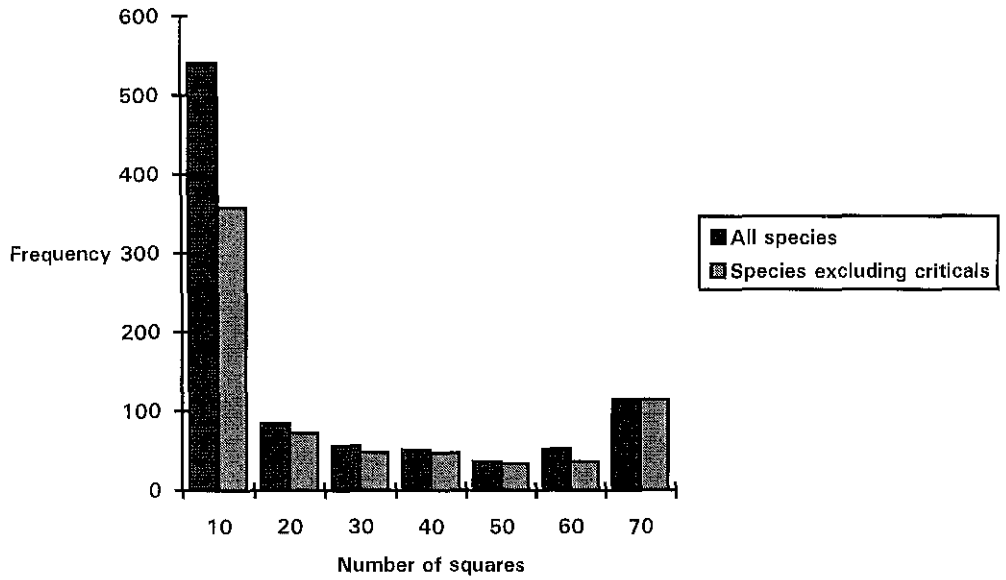


Figure 7. Number of species excluding critical taxa



The frequencies with which species have been recorded in 1-10, 11-20, etc., squares is shown in Figure 8. 194 (21.2%) species have been recorded in only one square, or 129 species (17.6%) excluding those with known recording bias. 34 (3.7%) species have been recorded in every square. This graph follows the reverse-J pattern as expected (Jaccard 1908), with many rare species and relatively fewer intermediate ones, and then a few more very common ones.

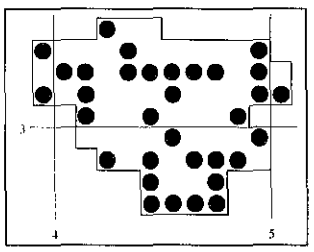
Figure 8. Number of species recorded in 1-10 squares, 11-20 squares, etc.



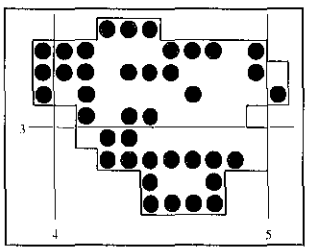
3. Comparison of the environment, recording and species data

The data were first investigated for systematic recording bias. Rich & Woodruff (1990) assessed recording quality by assuming that squares relatively poorly recorded would have below average proportions of grasses, common species and critical taxa recorded; the maps for these groups for Ashdown Forest are shown below:

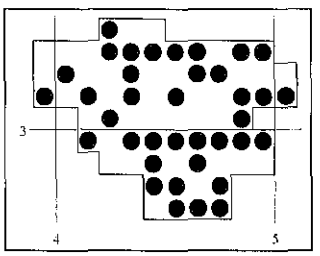
Below average proportion of grasses



Below average proportion of common species

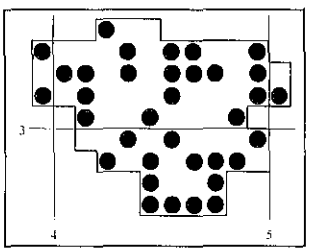


Below average proportion of critical taxa

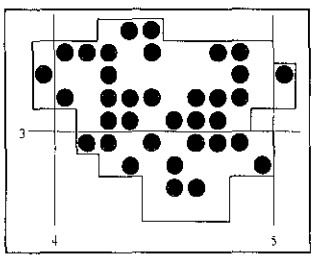


These measures of recording quality can then be combined to indicate squares relatively poorly-recorded and well-recorded. The squares with two or more measures of under-recording (i.e. relatively poorly-recorded), and the converse (i.e. relatively well-recorded), are shown below.

Squares relatively poorly-recorded.



Squares relatively well-recorded

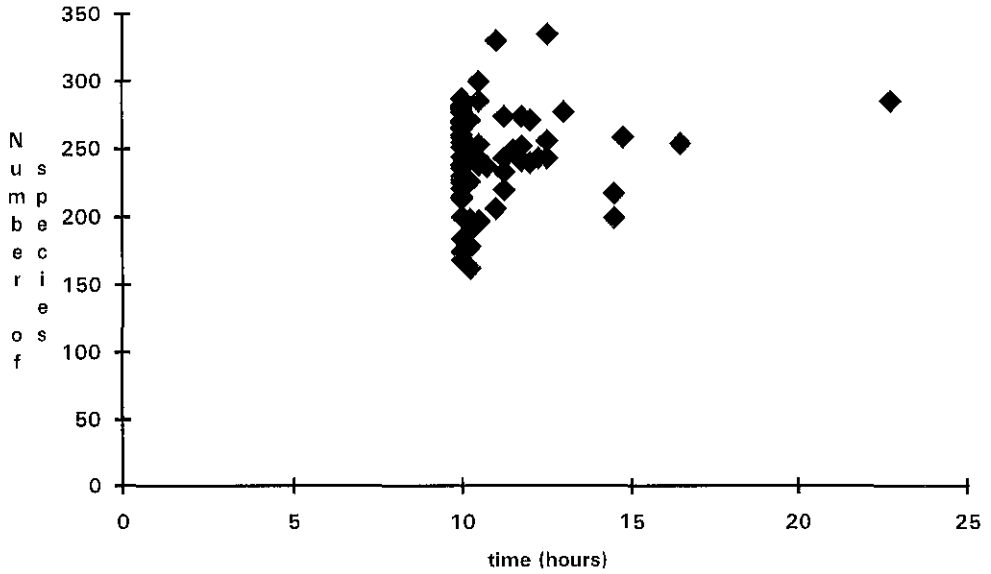


These maps show no relationship to the recording patterns, but the squares around the edge are generally poorly-recorded whilst those in the middle are well-recorded. This suggests that the maps are more a function of the distribution of the plant groups used to compile them than the botanists.

To test whether our species data are more closely related to the recording or environmental variables, we have first correlated various measures of both against the number of species recorded for each square. The correlations presented exclude species for which there is known recording bias (e.g. *Taraxacum*), but very similar results are obtained if all species are included.

It is well known that the number of species recorded is strongly related to the time spent recording (e.g. Rich & Woodruff 1990, 1992, Rich & Smith 1996). For our survey initially the time spent recording was significantly correlated with the number of species recorded in each square in 1993 ($r = 0.652$, $p << 0.001$) and in 1993-1994 ($r = 0.555$, $p << 0.001$) as expected. However, by the end of 1995 when the recording was complete and coverage was fairly uniform there was no correlation ($r = 0.201$, $p > 0.05$, not significant) suggesting that our species-richness is largely independent of effort (Figure 9).

Figure 9. Relationship between number of species and time spent recording ($r = 0.201$, $p > 0.05$).



Woodell (1975) demonstrated that independent visitors add significantly more species to squares than repeat visits by the same recorder, so it might be expected that more species would be recorded in squares visited by many different botanists. The relationship between number of species recorded and the number of different botanists who visited each square is shown in Figure 10; there is no significant correlation ($r = -0.059$, $p > 0.1$). This suggests that we have evened out this effect by getting many different botanists to visit each square.

As we have not had access to all land, it might be expected that the number of species would be related to the proportion of each square investigated. The relationship is shown in Figure 11 ($r = -0.19$, $p > 0.1$). The slightly negative relationship may be due to lower coverage around the margins of the Forest where there is not open access.

As many species have characteristic habitats, it might be expected that squares where more habitats are present would have more species. There is a strong relationship between the number of species and the number of habitats recorded in each square ($r = 0.657$, $p << 0.001$), and similarly between the total number of habitats present (Figure 12). This indicates that our species-richness data reflect the variation present in the environment.

Interestingly, there is a correlation between the number of botanical recording visits and number of species recorded for each square (Figure 13; $r = 0.32$, $p < 0.02$). This result is initially surprising, but, as Rich & Smith (1996) found, different botanists pick different areas to visit, so it might be expected that many different visits would result in more habitats being recorded (some visits were to record unsurveyed habitats). The number of visits is highly correlated with the number of habitats recorded

($r = 0.434$, $p < 0.001$; graph not presented), suggesting that this may be the cause of the relationship rather than recording bias.

The lack of correlation with most recording variables and similarity with environmental variables indicates that our species data are more closely related to variations in the environment than in the recording.

Figure 10. Relationship between number of species and number of different botanists ($r = -0.059$, $p > 0.1$).

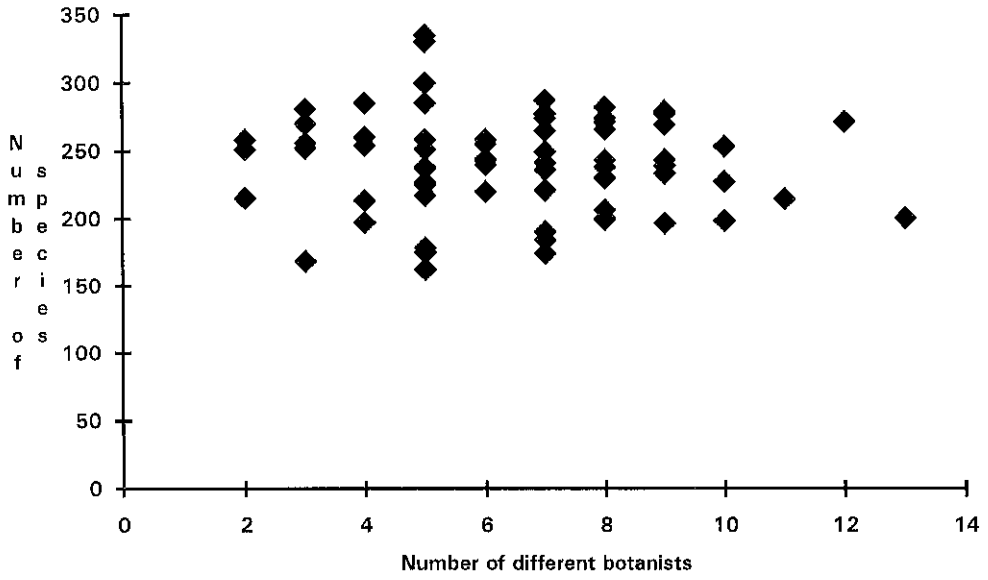


Figure 11. Relationship between number of species and percentage of square recorded ($r = -0.19$, $p > 0.1$).

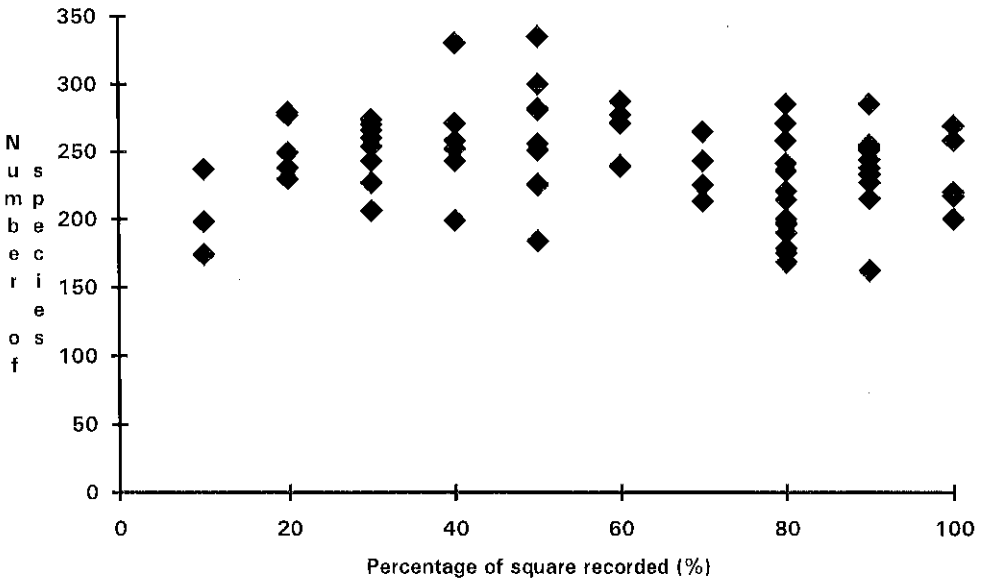


Figure 12. Relationship between number of species and number of different habitats recorded ($r = 0.657$, $p << 0.001$).

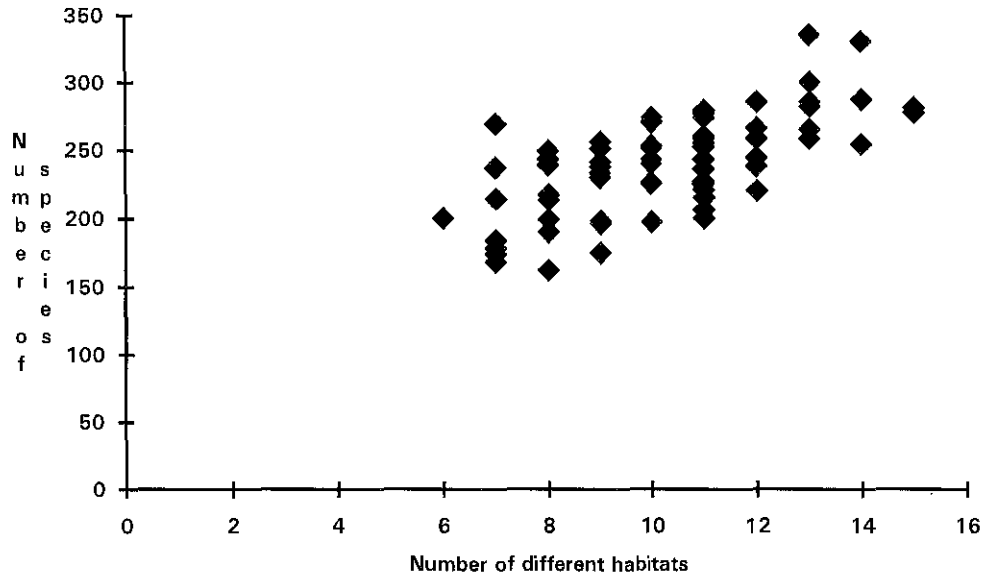
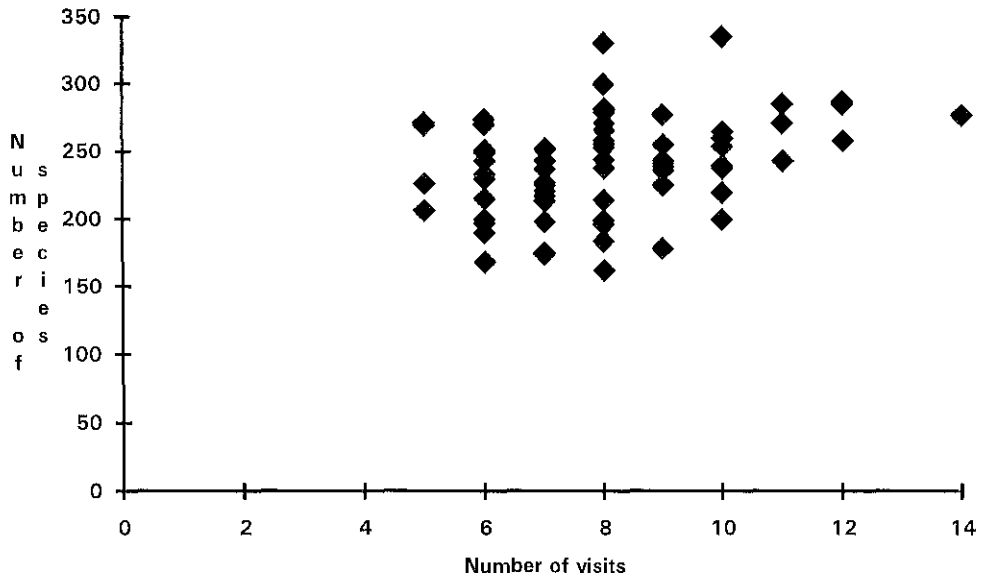
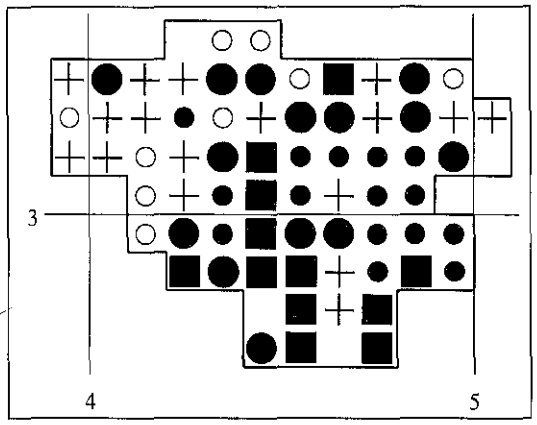


Figure 13. Relationship between number of species and number of visits ($r = 0.32$, $p < 0.02$).

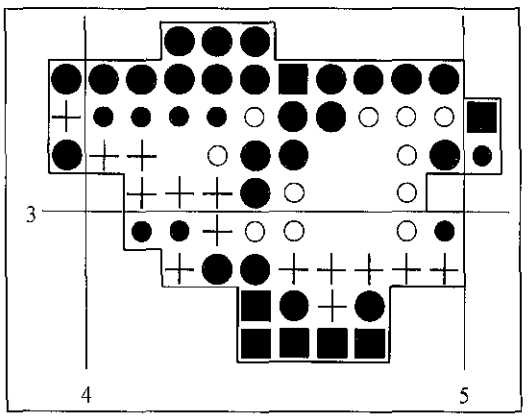


A second type of comparison has been carried out using a multivariate technique called Two-way Indicator Species Analysis (TWINSPAN). This is a computer program designed to perform a divisive cluster analysis on multivariate data which, in very simple terms, looks at sets of data with many variables and progressively splits them into smaller groups of similar samples. The patterns of squares produced by each TWINSPAN analysis can then be compared (the symbols simply indicate groups of closely related squares).



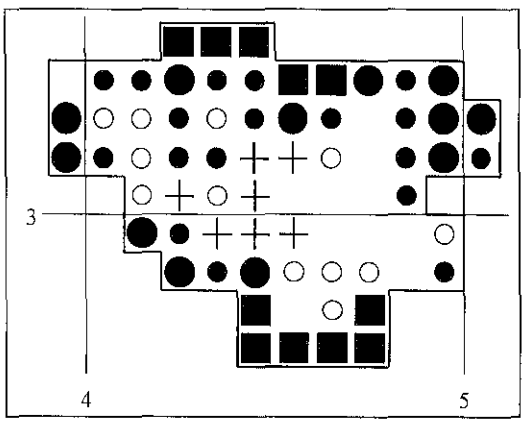
A. Recording data

A map of the TWINSPAN classes for the recording data has been produced using qualitative data of the squares recorded by each botanist, habitats recorded in each square, season of recording, and a quantitative estimate of time spent recording. This shows a wide scatter of different groups with one main block in the central east side of the Forest; the pattern cannot be clearly related to any recording patterns or distribution patterns of any individual species.



B. Environment data

A map of the TWINSPAN classes for the environment data has also been produced using the habitats, soils, geology, aspect and altitude present in each square. This shows a clear distinction between the centre and the outside of the Forest, and picks out the areas of high ground and the river valleys. Similar patterns can be seen in many individual species (e.g. *Primula vulgaris*).



C. Species data

A similar approach can be used for the species data (again excluding species with known recording bias). This shows a very strong distinction between the centre and the outside of the Forest and the areas of high ground are again picked out.

We therefore conclude from this pattern analysis that again our data are more closely related to variation in the environment than the recording.

4. Species correlations against environmental data

As our data are independent of the recorders, it is safe to compare them mathematically with the environmental variables. A similarity co-efficient has been used to describe how similar the environmental variables and the species maps are; it is a value calculated using a formula with the following properties:

100 means that the distributions match exactly.

0 means that the overlap is random (i.e. no coincidence).

-100 means a complete anti-correlation (i.e. are exact opposites).

The formula effectively gives a positive weighting to all squares where either both or neither environmental variable or species occurs, and a negative weighting to squares where one but not the other occurs, the final figure being a sum of the weights over all squares. The five best-fit environmental variables for selected species are given in the Table below. Note that these are to be used as indicators of variables to be investigated in more detail, as some correlations may be spurious the associations may not necessarily be causal; for instance *Wahlenbergia* is an obvious candidate for association with ancient woodland, but it is unlikely to be climatically limited to both north- and south-facing slopes.

SPECIES	ENVIRONMENTAL VARIABLE WITH THE FIVE HIGHEST SIMILARITY CO-EFFICIENTS (SIMILARITY CO-EFFICIENTS IN BRACKETS)
Aesculus hippocastanum	50-100 m altitude (24), Curtisden soils (23), Roads and verges (22), Main urban areas (20), Churchyard/cemetery (19).
Artemisia vulgaris	Mainly south-facing (24), Roads and verges (21), Car parks (18), Orchard (17), Wadhurst Clay (15).
Brachypodium sylvaticum	Curtisden soils (51), Ancient woodland (47), Roads and verges (47), Main urban areas (29), Mainly south-facing (24).
Carex sylvatica	Curtisden soils (43), 50-100 m altitude (42), Mainly north-facing (29), Alluvium (28), Pond/lake (22).
Dryopteris aemula	Plantation (29), Mainly south-facing (15), Pond/lake (15), Churchyard/cemetery (9), Curtisden soils (8), Stream/river (8).
Filipendula ulmaria	Alluvium (73), 50-100 m altitude (51), Curtisden soils (38), Mainly north-facing (32), Coppice (25).
Galium palustre	Pond/lake (43), Ancient woodland (34), Alluvium (24), 50-100 m altitude (24), Curtisden soils (24), Coppice (24).
Galium verum	Car parks (54), 200+ m altitude (32), Mainly south-facing (21), 150-200 m altitude (18), Mainly west-facing (12).
Medicago lupulina	Car parks (26), Roads and verges (16), Main urban areas (12), 200+ m altitude (12), Playing fields (12).
Narthecium ossifragum	150-200 m altitude (35), Car parks (34), Marsh/bog (24), Poundgate soils (21), Mainly south-facing (18).
Plantago coronopus	Car parks (59), 200+ m altitude (44), Roads and verges (22), Mainly south-facing (21), 150-200 m altitude (21).
Polygala serpyllifolia	Poundgate soils (28), 150-200 m altitude (25), Car parks (23), Bracken (14), 200+ m altitude (13).
Populus tremula	Ancient woodland (33), Curtisden soils (30), Wadhurst Clay (26), 50-100 m altitude (24), Car parks (21).
Primula vulgaris	50-100 m altitude (44), Roads and verges (28), Mainly north-facing (26), Wadhurst Clay (24), Alluvium (20).
Reynoutria japonica	Main urban areas (33), Ancient woodland (28), Churchyard/cemetery (24), Golf course (24), Curtisden soils (24).
Stellaria alsine	Plantation (43), Alluvium (32), Pond/lake (16), Ancient woodland (15), Coppice (15).
Ulex minor	Heathland (58), Bracken (42), 150-200 m altitude (36), Poundgate soils (31), Car parks (26).
Wahlenbergia hederacea	Ancient woodland (44), Curtisden soils (28), Coppice (13), Mainly north-facing (13), Mainly south-facing (12), Alluvium (12).

Similarly, environmental variables can be correlated with species, as shown below:

ENVIRONMENTAL VARIABLE	SPECIES WITH THE FIVE HIGHEST SIMILARITY CO-EFFICIENTS (SIMILARITY CO-EFFICIENTS IN BRACKETS)
Ancient woodland	*Wahlenbergia hederacea (40), Ribes rubrum (39), Carex laevigata (36), Veronica hederifolia (35), Hypericum tetrapterum (35).*
Car parks	*Euphrasia officinalis agg. (52), Ranunculus bulbosus (44), Galium verum (43), Linum catharticum (42), Agrimonia eupatoria (41).*
Churchyard/cemetery	*Symphoricarpos albus (65), Hypericum androsaemum (62), Reynoutria japonica (49), Calystegia silvatica (47), Galanthus nivalis (45).*
Disused railway	*Callitriche platycarpa (100), Chaenorhinum minus (99), Linaria vulgaris (99), Spiranthes spiralis (99), Rosa canina x obtusifolius (99).*
Heathland	*Festuca filiformis (63), Juncus squarrosus (61), Erica tetralix (59), Ulex minor (58), Nardus stricta (53).*
Main urban areas	*Symphoricarpos rivularis (66), Equisetum arvense (51), Melica uniflora (50), Reynoutria japonica (46), Veronica hederifolia (45).*
Marsh/bog	*Salix repens (34), Carex echinata (32), Salix aurita (29), Trichophorum cespitosum (28), Carex nigra (28).*
Plantation	*Senecio sylvaticus (32), Mentha arvensis (31), Stellaria alsine (30), Senecio vulgaris (27), Callitriche stagnalis (26).*
Pond/lake	*Lotus uliginosus (52), Iris pseudacorus (52), Malus domestica (52), Carex sylvatica (50), Galium palustre (47).*
Semi-natural woodland	*Fagus sylvatica (100), Castanea sativa (99), Blechnum spicant (97), Holcus mollis (97), Ajuga reptans (96).*
Stream/river	*Epilobium obscurum (66), Alnus glutinosa (63), Prunus avium (60), Carex sylvatica (59), Glyceria fluitans (59).*
Alluvium	*Filipendula ulmaria (60), Scirpus sylvaticus (55), Festuca gigantea (49), Lycopus europaeus (47), Chrysosplenium oppositifolium (46).*
Tunbridge Wells Sands	*Carpinus betulus (74), Melica uniflora (69), Acer campestre (66), Luzula forsteri (64), Atriplex patula (62).*
Wadhurst Clay	*Acer campestre (57), Crataegus laevigata (55), Carpinus betulus (55), Chrysosplenium oppositifolium (49), Melica uniflora (49).*
Curtisden soils	*Carex sylvatica (51), Rosa arvensis (50), Lychnis flos-cuculi (46), Prunus domestica (46), Arum maculatum (45).*
Poundgate soils	*Juncus squarrosus (61), Carex panicea (44), Carex echinata (43), Ribes nigrum (39), Polygala serpyllifolia (38).*
Wickham 1 soils	*Acer campestre (82), Crataegus laevigata (81), Polypodium agg. (81), Oenanthe crocata (75), Luzula forsteri (71).*

5. Comparison with *Sussex Plant Atlas*

The *Sussex Plant Atlas* was recorded using tetrads between 1966 and 1978 (Hall 1980). It was recorded on an *ad hoc* basis with no standardisation in the recording, and thus provides a useful comparison with our data. For the comparison we have summarised our 1-km square data into the 14 tetrads which directly correspond to the *Sussex Plant Atlas* but also including tetrads 43A and 43V for which we have only recorded three of the four 1-km squares.

When the number of records for each tetrad were compared the results shown in the table below were obtained. We have recorded on average nearly half as many species again as the *Sussex Plant Atlas*, indicating that the *Sussex Plant Atlas* was under-recorded. About 6.5% of the species recorded in the *Sussex Plant Atlas* were not recorded for our flora, indicating that more species could be found in our squares. Application of Dony's (1963, 1976) species-area relationship for Hertfordshire to our data suggests that a mean of 223 species would be expected for each 1-km square; we have recorded an average of 241 species per 1-km square (excluding critical species) which suggests that Dony's equation needs revising based on Sussex data.

Numbers of species recorded in tetrads in the *Sussex Plant Atlas* and summarised from our Ashdown Forest data.

Tetrad	*Sussex Plant Atlas (SPA)*	Ashdown Flora, all species (AF)	% (SPA/AF)
42J	267	416	64
42N	354	487	73
42P	287	412	70
42T	351	484	73
42U	244	359	68
42Z	247	382	65
43A	241	403	60
43B	245	425	58
43F	253	379	67
43G	223	400	56
43K	283	387	73
43L	315	444	71
43Q	225	356	63
43R	297	386	77
43V	270	321	84
43W	290	381	76

The correlations between species numbers, recording and environmental data in Section 3 above were repeated for our Ashdown Flora data in tetrads with identical conclusions, again indicating our data are independent of the recording. A Twinspan analysis for comparison with the *Sussex Plant Atlas*, shows that the *Sussex Plant Atlas* data and the Ashdown Forest data do not match well which must be due to variations in recording, but neither pattern matches the environment data very well. This suggests that the recording may be an important factor to be taken into account in any analysis of results.

SPECIES ACCOUNTS

Latin names follow Stace (1991) unless otherwise stated so authorities have not been given. The first English name given follows Stace (1991), followed by Sussex names from Arnold (1907), Grigson (1955) or local sources.

Species in [square brackets] are currently thought to be errors, are not properly naturalized, or are probably from outside the Flora area. An asterisk * in front of the name indicates that the species is not native or probably not native in the Flora area.

Historical records for the Forest are given in approximate date order, quoting the original source wherever possible (records repeated in later publications are not duplicated). The herbaria are cited using their standard abbreviations (Kent & Allen 1984). Literature sources are listed in the bibliography with the exception of those in Ashdown Forest News (*AFN*) which are cited in brief. Tetrad nomenclature follows the standard BSBI DINTY system (Ellis 1986) (see Figure 14); note that this is **NOT** the system used by Hall (1980) and Briggs (1990) whose tetrads have here been reallocated to this standard system.

Figure 14. The DINTY tetrad system within a 10-km square (so-called after the second line).

E	J	P	U	Z
D	I	N	T	Y
C	H	M	S	X
B	G	L	R	W
A	F	K	Q	V

Details of the current distribution and ecology are given usually with 6-figure or 4-figure grid references for many uncommon species, but not for the most sensitive rare plants. As all the records are from the 100-km square TQ(51) this is not given.

Details of the British and world distributions are taken mainly from Clapham, Tutin & Moore (1987) to help put the local distributions into a wider context.

The initials of the botanists are as follows:

AB	Alec Bull	NM	Nicky Muggeridge
AH	Arthur Hoare	NN	Nigel Nicholson
AK	Alan Knapp	PA	Penny Angold
AN	Alan Newton	PC	Patrick Coulcher
CM	Chris Marrable	PD	Pat Donovan
DB	David Bevan	PH	Paul Harmes
DE	Dave Earl	PR	Pete Reader
DK	Dave King	PS	Peter Sollars
DS	David Streeter	PW	Phyllis White
EL	Eimear Nic Lughadha	RC	Rob Cook
ER	Elizabeth Rich	RN	Rachel Nicholson
FR	Francis Rose	RR	Rob Randall
HP	Helen Proctor	RW	Raymond White
JK	Jan Kirschner	SR	Sarah Richardson
MM	Malcolm McFarlane	TR	Tim Rich
MR	Madeline Reader		

Other abbreviations are as follows:

BEX	Bexhill Museum	*AFN*	Ashdown Forest News
BM	Natural History Museum, London	AFRR	Ashdown Forest Rangers' records (various sources)
BTN	Booth Museum, Brighton	BRC	Biological Records Centre data
CGE	Cambridge University herbarium	BSBI	Botanical Society of the British Isles
NMW	National Museum of Wales	SBRS	Sussex Botanical Recording Society
OXF	Oxford University herbarium	agg.	aggregate (closely related plants)
LIV	Liverpool Museum	det.	determined by
LTR	Leicester University	*et al.*	with various others
TLS	Tunbridge Wells Museum	s.l.	*sensu lato*, in a broad sense
		s.s.	*sensu stricto*, in a strict sense
		*	not native in Flora area
		+	onwards, or with various others

Pteridophytes

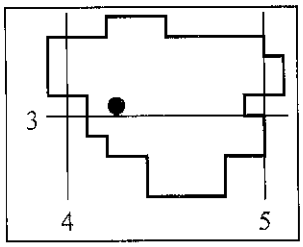
LYCOPODIACEAE

Huperzia selago. **Fir clubmoss.**
Ashdown Forest, J. Woods (**BTN**). On the Forest near Wych Cross (Cooper 1835). Marshy pool, Ashdown Forest, 1862, G. P. Davies (**BTN**). Ashdown Forest, N. J. Treutler, 1886, and near Wych Cross, E. Jenner (Arnold 1887). Seen in April 1901 on the west side of Ashdown Forest "the young shoots of heather rendering it very inconspicuous", but not in June 1902 (Clark 1903). (Records in Jenks 1967 surely refer to *Lycopodiella inundata*).

These are the last Ashdown Forest records for a northern, montane species, which although once reasonably widespread on the lowland acidic heaths is probably now extinct in south-east England. Many of the sites have disappeared due to loss of habitat and scrub invasion resulting from lack of grazing. This does not appear to be the reason for its disappearance from Wych Cross, where open heathland still occurs; it may have been destroyed in a fire (e.g. Rackham 1986). The last Sussex record was from Bingletts Wood near Heathfield, c.1965, FR, and the nearest sites are now in Derbyshire and Devon.

The presence of a plant which occurs on acidic soils and peats in the higher mountains around the world and the Arctic is a little surprising in lowland England, but Jermy *et al.* (1978) suggest that frost hollows give the required lower temperatures in areas of higher rainfall. The old Forest records indicate it grew on wet ground on the exposed ridge, probably the most suitable site climatically.

Lycopodiella inundata (Lycopodium inundatum). **Marsh clubmoss.**



Crowborough Common, C. E. Britten; Near Forest Row, Miss Davenport; Broadstone Warren, E. Jenner; Chuck Hatch, 1848, J. Weaver; between Chelwood Gate and Pippingford, Miss K. Pickard (Wolley-Dod 1937). Chelwood, 1957, and suffering from horses hoofs, 1965 (*Bulletin Kent Field Club* 3: 9 and 11: 27). Tetrads 42P and 43F (Hall 1980). Three other populations known to FR have gone; south of Chuck Hatch (474.320), last seen in the 1950s, north of Londonderry Farm (444.293) and at Goat cross-roads (402.327) - the latter last seen in 1986 (Briggs 1990).

Still present from 1993 onwards in the classic site between Chelwood Gate and Pippingford Park (42.30, tetrad 43F), with two big patches and three smaller ones all within 20 metres where it has been known since at least 1950, E. C. Wallace. Like *Huperzia* and *Lycopodium,* the prostrate shoots can look like young *Calluna* or *Erica*.

Marsh clubmoss is a species of wet peaty areas on lowland heaths. It probably requires open ground created by a little disturbance once provided by grazing animals or possibly peat cutting. The shoots creep along the ground at a rate of 2-10 cm per year, and each branch shoot lives for a couple of years. It produces fertile shoots in late autumn (Headley 1994). On Ashdown Forest it occurs on bare, brown, peaty patches where water lies in the winter. The shoots are readily shaded out by *Calluna, Molinia* and *Erica tetralix* and this is probably the reason it has gone from all of FR's sites so the patches must be kept open to conserve it in its last site. An alternative technique is to transplant it, which has worked on Heyshott Common (Briggs 1990), and a few plants from the known site were transplanted c. 500 metres to the north west by the Rangers in 1995 in case of fire or trampling, but did not survive the 1995 drought; further transplants are planned.

It is declining throughout lowland Britain and probably through much of its range in north-west Europe too. It is a Nationally Scarce Species (Headley 1994), and has been recorded in 64 10-km squares since 1970, and about twice that number before 1970. The main strongholds are the Surrey and West Sussex heaths and the New and Woolmer Forests. It also occurs in North America.

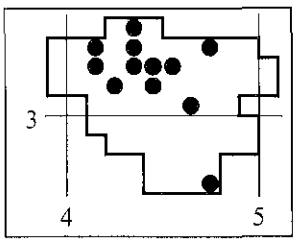
Lycopodium clavatum. **Stag's-horn clubmoss.**
On Ashdown Forest (Coleman 1836). Ashdown Forest, N. J. Treutler, 1886 (Arnold 1887). Crowborough 1899, A. G. Gregor (Wolley-Dod 1937). Ashdown Forest, 1895, K. Dixon (**BTN**). Reported from the west side of the Forest as luxuriant, "covering several yards of ground" (Clark 1903). Patch apparently spreading, probably near Chelwood, 1965 (Bulletin Kent Field Club 11: 27). Tetrad 42T (Hall 1980).

Now probably extinct on the Forest. The last site was a small hidden quarry near Legsheath (398.330), c. 1983, DS & CM, and it was also known about half-way down the old airstrip (42.30) where it was last recorded in c. 1976, S. Stuart.

In the 1970s it was found in many new sites in the Weald especially on rides in Forestry plantations on the Tunbridge Wells Sands (Briggs 1990), but it does not persist for long and by the 1990s had declined again. Brewis, Bowman & Rose (1996) suggest that it needs some disturbance to persist. It generally occurs in acidic grassland, grassy heaths, open foresrty rides and sometimes rough woodland, and almost always on acidic soils; Jermy *et al.* (1978) note it occurs on slopes allowing surface water to flush through the vegetation. It is quite widespread in northern Britain, but is decreasing in England (Rich & Woodruff 1996). It is quite widespread in northern Europe but occurs in the mountains in the south.

EQUISETACEAE

Equisetum fluviatile. **Water horsetail.**



Six tetrads (Hall 1980).

Recorded frequently from the wetter valleys south of Forest Row, at Old Lodge and in a pond in the corner of Furnace Wood. Almost all localities are in ponds, often where there is other vegetation and bottoms choked with silt, or in gentle flushes in some of the springs. Many of the sites are shaded. It has been suggested to be particularly abundant in marl pits but this has not been confirmed.

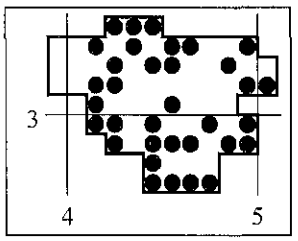
It is widespread in Britain from the rich ditch systems of Sussex grazing marshes such as Pevensey Levels, to clear nutrient-poor lakes in Scotland. Jermy *et al.* (1978) note the ecology is little understood. It is widespread in Europe, temperate Asia and North America.

Equisetum* × *litorale (E. fluviatile* × *palustre). **Shore horsetail.**

Ashdown Forest, c. 1955, R. A. Boniface (BRC). Not refound.

Jermy *et al.* (1978) note that this hybrid is surprisingly frequent in Britain and Ireland given the dissimilarity of the habitats of the parents. There is a distinct cluster of records in the north Weald which is probably due to the efforts of a single recorder.

Equisetum arvense. **Field horsetail.**

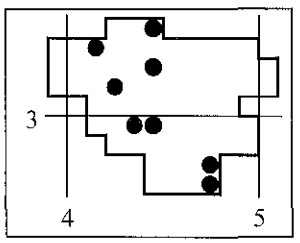


Common in tetrads around the edges of the Forest (Hall 1980).

We have recorded it quite widely in arable fields, gardens, waste ground around the edges of the Flora area, and on roadsides on the Forest. It is distinctly uncommon on the Forest.

Common and widespread in Britain, and recorded in Europe, central China, North America and Greenland.

Equisetum palustre. **Marsh horsetail.**



Tetrads 33V, 43F and 43K (Hall 1980).

Recorded from scattered squares around the edge of the Forest, and in the Chelwood area. Jermy *et al.* (1978) note that it requires moving groundwater with a medium base-content (calcium/magnesium), and it may occur where the soils are less acidic.

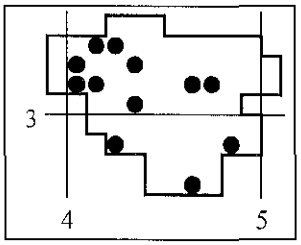
It is frequent in Sussex, and common and widespread in Britain, Europe, temperate Asia and North America.

Equisetum telmateia. **Great horsetail.**

Recorded from tetrads 42N, 43K, 43L, 43M and 43V in Hall (1980), some of which may have been from outside our area, but oddly not recorded at all during our survey. This species often occurs on wet clays in Sussex often by spring lines where there is some water seepage, a habitat not present in most of Hall's tetrads on the Forest. It is found locally throughout Europe, Asia, North Africa and North America.

OPHIOGLOSSACEAE

Ophioglossum vulgatum. **Adder's-tongue.**



Tetrads 43G (Hall 1980) and 42T (Briggs 1990), and refound in both.

The main habitat on Ashdown Forest is on the more floristically-rich verges, clearly where there is some base-enrichment from the road, and some patches may be 5 metres long. Twyford Lane (404.314), 1995, CM; near Goat cross roads (402.325), 1993, TR & NM; Priory Road (405.328), c. 1993, CM; both sides of Hindleap Road (418.319), 1995, CM; A275 near Wych Cross Place (419.315), 1990, CM; thousands on private meadows and lawns, Old Cherry Cottage (41.33 and 42.33), 1995, PS; Chelwood Vachery drive (435.304), 1993, TR & NM; east of the Visitor Centre (434.323), 1992, NM and 1995, CM; verge 30 metres NE of car park, Gills Lap (468.315), 1995, TR; verge 100 metres west of Greenwood Gate (478.314), 1995, TR; Poundgate verge (482.285), 1995, CM, big colony, 1995, PS; two fronds, Toll Lane wood (461.263), 1993, TR & NM, not refound subsequently.

This small, grass-green fern is very difficult to see, and is probably generally under-recorded (e.g. Briggs 1990 gave about twice as many records for Sussex as Hall 1980). It is found most easily in April or May before the vegetation closes over, and the fronds have usually died down by the end of June or been mown.

It is widespread but rarely common in England, but rarer in Wales and Scotland where it is predominantly coastal (Jermy *et al.* 1978), and it is also widespread in Europe, Asia, North Africa and North America.

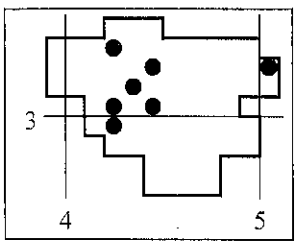
Botrychium lunaria. **Moonwort.**
On the Forest between Fisher's Gate and Maresfield, on the open part of the Forest between Crowborough Warren and the new church, and between Coleman's Hatch and Forest Row, E. Jenner (Arnold 1887). These are the last records for the Forest where it is probably long extinct.

The records of *Botrychium* from acid heathland are initially somewhat surprising, as it is usually a calcicole of well-drained sites in rich mountain grassland, limestone grassland and sand dunes. However, it does occur on calcareous heaths in the Breckland, and on acidic soils such as Witley Common in Surrey with heather, and also under bracken (Lousley 1976). It has certainly declined in south-east England and was last recorded in Sussex near Brighton in 1965 (Hall 1980). Not seen in Kent since 1947, and only in three squares in Surrey recently.

Widespread in northern Europe, and in the mountains in the south, and in Asia Minor, Himalaya and Australasia.

OSMUNDACEAE

Osmunda regalis. **Royal fern.**



On Ashdown Forest (Forster 1816). In some of the bogs on Ashdown Forest (Coleman 1836). In the forests, rare, E. Jenner (Arnold 1887). Ashdown Forest but victim of vandalism (Pickard 1930). Chuck Hatch, 1931, E. C. Wallace (Wolley-Dod 1937). Chelwood Gate (probably 42.30), two big clumps and several others scattered around, 1948, 1949, G. Dent (Dent 1928-1953). Chelwood Gate 1955, R. A. Boniface (BRC).

Native plants occur in the following sites: on the side of a slit trench (422.308) and in a drainage gully (c. 423.305) east of the Isle of Thorns, 1991+, CM & NM; one plant in a root plate by the path near Hoadley's Farm (506.324), 1994, TR *et al.* which disappeared when the root plate fell on it during the winter before it could produce spores; Broadstone Warren (42.33), CM, 1995. This last site is superb, with four large fertile clumps (one with fronds to 2 metres tall, and another epiphytic on the bole of an alder coppice) and about seven young plants in an open, flushed alder wood with beech fern.

It has been taken frequently from the wild into gardens, and has probably re-established itself in the wild again from spores. We have recorded it introduced in the following sites: planted in Chelwood Vachery around the bog pool (431.294), 1994, MR, PR & TR; one plant by a pond at Home Farm, Pippingford Park (443.304), 1993, PD & TR; several clumps by a swimming pond, Northbank Wood (434.319), 1995, TR & PA where G. Dent regularly recorded it (Dent 1928-1953); planted around springs in Pheasantry (440.315 - not plotted) and present to at least 1986, M. Tebbutt; one by pond, Ridge Road (448.329), 1992+, CM & NM; in the rockery at Oldlands Hall (476.275), 1995, PD *et al.*

Royal fern is one of those wonderful plants whose bright green foliage contrasts with the golden fertile fronds. In the Weald it tends to grow in valley bogs or damp woodland, and sometimes on the sandrocks, but is never now abundant, and Hall (1980) regards Ashdown Forest as the only native area in Sussex. Wolley-Dod (1937) gives 35 records but notes it was formerly more common, and Hall (1980) only gives half that number of tetrads including introduced sites.

It is scattered through Britain mainly in areas with high rainfall, from sea cliffs in Cornwall to fens in East Anglia and bogs in the north and west, and even in a limestone crevice at an altitude of 400 metres on Ingleborough, Yorkshire. In Ireland it is often abundant on abandoned peat cuttings. It is a western sub-Atlantic plant in Europe, and occurs widely in the tropics, and North America.

MARSILEACEAE

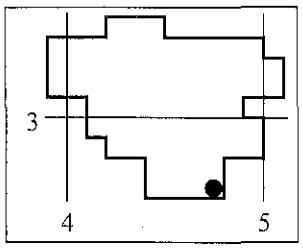
Pilularia globulifera. **Pillwort.**
In a bog at Quarry Brook [Quabrook = a boggy place] on the right of the road from Hartfield to Forest Row, E. Jenner (Arnold 1887); this record is from what must have been an excellent boggy site, but is now drained. Ashdown Forest near Nutley, 1957, R. A. Boniface (BRC).

Pilularia is now probably extinct in Sussex. Wolley-Dod (1937) recorded 19 sites, and the sites at Horsham and Piltdown (Hall 1980) have gone. A more recent site near Crawley (Briggs 1990) was recently destroyed by landfill. It is now a Nationally Scarce Species recorded in 162 10-km squares before 1970 compared to only 90 since 1970. Most of the decline occurred between 1918 and 1950 (Jermy 1994).

Pilularia is a plant of lowland nutrient-poor pond and lake margins where there is some disturbance or bare ground. It is a western European endemic, with the bulk of the sites occurring in lowland Britain, France, northern Germany and Sweden. It is declining in much of mainland Europe. The New Forest is thought to support the largest concentration of sites.

HYMENOPHYLLACEAE

Hymenophyllum tunbrigense. **Tunbridge filmy-fern.**
Furnace Wood, c. 1955, FR (tetrad 42T in Hall 1980). Thought lost due to tree felling but one patch refound 1975, M. Rickard, 1985, FR (also reported just outside the Flora area at Rock Wood on the opposite side of the valley to Furnace Wood, DS, but not seen recently).



One plant on a vertical, north-facing rock beneath an 80% canopy cover of birch, mountain ash and pine in replanted ancient woodland (47.26), 1993, RN *et al.* It survived the severe summer drought of 1995 well as the rocks stayed damp through most of the summer. In 1994, one small part of the patch was peeling off and dying, so it was transplanted to a nearby ledge where it has subsequently grown and spread.

Tunbridge filmy-fern was first found at Tunbridge Wells by G. Dare in the 1600s (hence the name), and has been recorded in about 20 localities in south-east England. Most sites are concentrated in the Ardingly and Tunbridge Wells complexes of sandrocks in the north of the Weald, with Furnace Wood as an interesting outlier. In 1994/1995 a total of 77 patches were found in 24 colonies in twelve sites (six of these have only one plant), and it was probably extinct in eight sites, a 68% decline in the number of colonies and 20% loss of sites since the 1950s (Rich, Richardson & Rose 1995). The decline is due to a combination of loss of woodland cover, dense shade especially from rhododendron, and storm damage; historically, collecting and public pressure have also caused losses.

Tunbridge filmy-fern is one of a number of western oceanic or Atlantic species most frequent on the west coasts of Britain and Ireland which are also found in the mild, damp climate of the Weald in Sussex and Kent (e.g. *Dryopteris aemula, Wahlenbergia hederacea*; Rose 1952). It is characteristic of steep, porous sandstone rock faces usually surrounded by deciduous woodland with a particular microclimate, and it often grows with Atlantic bryophytes. It occurs locally in western Europe and Macaronesia.

POLYPODIACEAE

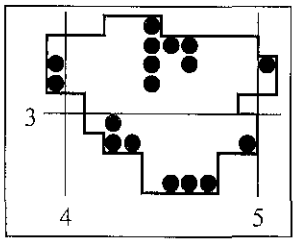
***Polypodium*. Polypodies.**

British *Polypodium* is composed of three segregates forming a polyploid series with hybrids. *P. cambricum* has two sets of chromosomes and has not been found. *P. vulgare s.s.*, with four sets of chromosomes, and *P. interjectum,* with six sets, have been both recorded. The records have all been checked under a microscope; *P. vulgare* has 10-13 thick walled cells on the annulus, and *P. interjectum* 7-9. The hybrid between them has misformed spores and is reputed to be frequent.

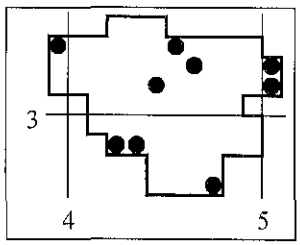
The old records - Ashdown Forest, 1895, T. Hilton (**BTN**), and all the records in Hall (1980) - are for the aggregate *P. vulgare sensu lato*.

We have mapped both the aggregate and the two segregates. In the summer drought of 1995 many fronds did not produce sporangia which prevented us from completing our research into the distribution of the segregates. However, from the data available the two segregates are about equal in frequency, and occur in similar places. They are most typical of the banks of sunken lanes, as around Coleman's Hatch (45.33). *P. vulgare s.s.* has been recorded as an epiphyte only at Keyward's Wood (504.324), perhaps reflecting the lack of old woodland trees on the Forest. In southern England *P. interjectum* is reputed to require more base-rich substrates and be more shade tolerant, and is thought to be the more widespread species (Stace 1991). The polypodies occur over most of Europe, the Far East, Macaronesia, eastern North America and South Africa.

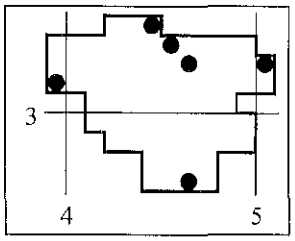
Polypodium s.l.



Polypodium vulgare s.s.
Polypody

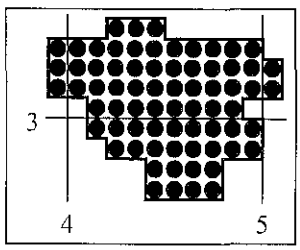


Polypodium interjectum
Intermediate polypody



DENNSTAEDTIACEAE

***Pteridium aquilinum*. Bracken.**



Ubiquitous on acidic soils in both Hall (1980) and our survey, and consequently there are no specific old botanical records but there are numerous social ones, including a 1274 reference to it being used by the 'customary tenants' for fuel. Bracken was one of the main products of the Forest, with one of the ancient commoners' rights being to cut 'brakes and litter'. After 1 August bracken was cut by hand by both men and women and taken off in carts as shown in the picture in Glyn & Prendergast (1995). It was used locally for bedding for stock, litter for hens, manuring land and at Woodlands Nursery. It was also sent as far away as Hailsham (pers. comm. J. Walters, 1995) and even to the London markets. Jenks (1967) notes it was sold, though this may be illegal as commoners were supposed to use it themselves. In the 1950s near Chelwood Gate it was cut by hand, left to dry and then taken in for bedding for pigs (M. Morley, pers. comm. 1996).

In some areas of the Forest there are large, impenetrable stands of bracken which are a major fire risk. It has probably increased and spread into many heather areas due to reduced cutting by commoners and lack of grazing by cattle. It especially takes over dry heathland after fires, new plants often establishing from spores at the foot of slopes where the soils are temporarily enriched by ash. Similar increases have occurred on other commons in Sussex (Rose 1992) but not in the New Forest (Tubbs 1986). Dense bracken has few other associated species, and the litter layer smothers other plants attempting to grow beneath it. Some stands occur on richer soils by the roadside and may be mixed with *Urtica dioica* and *Galium aparine*. The soils are usually acidic and measurements of pH 3.5, 3.7, 3.9, 4.2, 4.3 and 4.4 have been obtained for six sites.

There have been several trials to see how it can be controlled. About 40 hectares of the military training area were sprayed by helicopter with Asulox (Asulam), two applications giving a 90% kill. The effects on other plants were not recorded, but some such as *Rumex acetosa* are known to be very sensitive (Asulam was formulated to control docks) and no large scale spraying is allowed on the Forest areas managed by the Conservators.

Mowing when the fronds are first expanded and again about 3 weeks later for 6-8 years reduces it by about 95%; the final 5% can be cleared by hand application with Asulox. The areas revert to acidic grassland and are usually dominated by *Deschampsia flexuosa*.

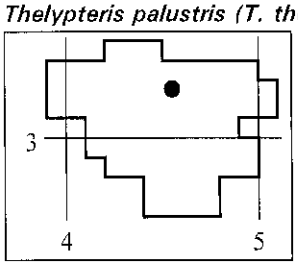
Scraping back down to the subsoil has been carried out since 1989, treating roughly one hectare a year. These areas are reseeded with heather litter and within 18 months become *Calluna*-dominated heath. The bracken peat removed is used by the Royal Botanic Gardens at Wakehurst Place as a mulch for shrub borders, and to protect sensitive plants from frost (*AFN* 30:6); in autumn large piles can be seen waiting for collection from various car parks.

Studies of bracken in Britain have shown that stands may consist of a number of genetically distinct clones which differ in response to nutrient availability, frost and competition, and some clones as big as 390 metres long have been reported (Sheffield *et al.* 1989). It is frost-sensitive and tends not to occur in frost pockets in valley bottoms; a sharp frost in May 1995 damaged many plants in hollows around the Forest. At the bottom of Millbrook, plants in the open were killed by direct radiation frost, but those in woodland 10 metres away were unaffected.

Probably one of the five most common plants in the world. Cosmopolitan through Europe (though rare in the Arctic) to volcano tops in Kenya and to the Far East. In Japan young fronds are eaten as a delicacy although they are carcinogenic - there is little evidence that the spores are carcinogenic as has been widely reported in the popular press.

THELYPTERIDACEAE

Thelypteris palustris (T. thelypteroides). **Marsh fern.**

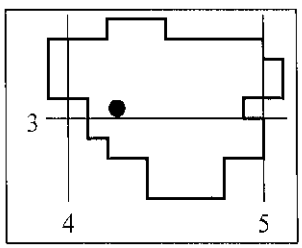


On the bog in Ashdown Forest where the road crosses the water on the way from Eridge Road to Groombridge in abundance (Forster 1816), and 1846, W. W. Reeves, but not seen "in recent years" (Wolley-Dod 1937); it is unclear if this locality is actually on Ashdown Forest as the wording is ambiguous. Near Newbridge, 1931, Miss K. Pickard, and 1937, A. H. Wolley-Dod. Still present (Hall 1980).

On a special hunt in 1994, we found one small c. 5 x 3 metres ± infertile patch in a very wet iron flush beside the stream at Newbridge, with *Myosotis secunda*, under dense shade from alder and willow. The iron flush has a slightly elevated pH *c.* 6.5 compared to *c.* pH 5.5 elsewhere. Barely had we suggested that a couple of large, overhanging branches should be removed to give it more light than the Rangers had obliged, and in 1995 five of the crowns had fertile fronds.

Marsh Fern is a Nationally Scarce Species in Britain recorded in 85 10-km squares since 1970 (Jermy 1994). It occurs in reed swamp, fen carr, new peat cuttings and valley mires where there is a high winter water table. It is thought to be declining due to drainage of mires, possibly coupled with changes in fens to *Sphagnum* communities and acidification (Jermy 1994). It has declined in Sussex from Wolley-Dod's (1937) 13 sites to only three in the *Sussex Plant Atlas* (Hall 1980). It is more widespread in central and eastern Europe, across the northern hemisphere and tropical Africa.

Phegopteris connectilis (Thelypteris phegopteris). **Beech fern.**



Boggy spot near Kidbrook Park Pales, E. Jenner (Forster 1842). Near Forest Row, F. V. Paxton, 1854 (Arnold 1887). "A note by W. W. Reeves says that about 1870 the fern was all taken from the bog at Forest Row by a lady from Tunbridge Wells and has not reappeared since" (Wolley-Dod 1937). Some plants further up the stream survived this act by 'Disgusting of Tunbridge Wells', and a patch was subsequently found in the valley alder carr between Hindleap Warren and Kidbrooke, 1948, R. A. Boniface. In some quantity at Kidbrooke (416.335) until at least *c.* 1970 (Rose 1995), the record given incorrectly in Hall (1980) for the tetrad to the east. Also still persistent where introduced at Standen outside the Flora area (Briggs 1990).

The Kidbrooke site has been searched repeatedly since the 1970s (and annually 1993-1995) without success, and there is no obvious reason for its disappearance as the large, damp alder woodland is still apparently suitable and has been the same for at least 50 years. In September 1995 a new colony was found by CM (his attention drawn to it by the *Osmunda* growing with it), probably the most exciting rediscovery of an "extinct" East Sussex plant during the Flora. The colony was *c.* 17 metres wide by 6 metres long with many patches, in a damp flush on private land to the east in Broadstone Warren. The plants were in a wet flush with *Juncus acutiflorus, Sphagnum* spp, *Hydrocotyle vulgaris* and

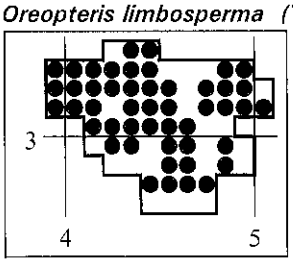
Viola palustris in an open alder coppice with about 50% canopy cover where some coppice stools were about 2.5 metres diameter at the base. The fern was growing out in the open and had many healthy, fertile fronds.

To those more used to seeing the plant in rocky woods, slopes and mountains in the north and west of Britain, this habitat in wet alder flushes may be a bit surprising but all the Sussex localities are the same, and it may be the only situation in which it can survive the summer droughts in the south-east. Jermy *et al.* (1978) note it prefers humid banks where moving water can flush through its root system.

Beech fern is yet another species more widely distributed on acidic substrates in the north and west (where it can be frequent), but very rare in the Weald, and not found elsewhere in the south-east. The other Sussex colony at Worth Forest has not been refound recently (the woodland was coppiced, the ground Flora became over-grown with brambles and the fern disappeared), and now it is otherwise only known in the Weald near Haslemere, in Surrey.

It is locally frequent on the continent where climate and substrates are suitable particularly in the mountains, although rare in the warm and dry lowlands in the west. Also found in Asia and North America.

Oreopteris limbosperma (Thelypteris limbosperma). **Lemon-scented fern.**



Ashdown (Cooper 1835). Edges of bogs on Ashdown Forest, plentifully (Coleman 1836). Chelwood Common, N. J. Treutler, 1886; Ashdown Forest, W. Borrer (Arnold 1887). Ashdown Forest, 1894, E. H. Farr (**BTN**). Ashdown Forest near Old Lodge (Done 1914). Crowborough Warren (Wolley-Dod 1937). Common on the Forest (Hall 1980).

Once an eye for the habitat has been learnt, it can be found scattered throughout the Forest, especially in the valleys, but rarely in abundance. The most typical place to find it is along the edges of streams in damp shaded conditions, usually as a group of a few plants. It is rare in the open, except in Broadstone and Hindleap Warrens where it is surprisingly common on the edges of some open rides where the soil is wet; both these are steep, north-facing slopes.

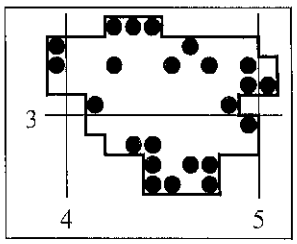
It is probably restricted in Sussex as elsewhere by low rainfall, and in Britain is widespread wherever precipitation exceeds 80 cm per year. It is most abundant in the north and west where rainfall is higher again, and there occurs regularly out in the open on moist acidic (pH 4 - pH 5) soils which often have some organic matter and at least seasonal movement of water through the roots (Rodwell 1992).

It lives up to its name of lemon-scented fern, the crushed foliage smelling very distinctive when fresh. Its fronds are also a lighter, more yellow-green, and the sudden change to tiny pinnae towards the base of the fronds immediately distinguishes it from the other ferns.

Elsewhere in Sussex it is locally abundant in woods and on damp heaths in St Leonard's and Worth Forests, but very rare and scattered elsewhere. It also occurs abundantly in the New Forest, more locally within the Kent Weald, around London in Surrey, Buckinghamshire and Essex in suitable acidic places, and one plant was even refound near Hampstead Heath in London in 1995. It is quite common in the north and west of Britain, and in the wetter areas of north and west Europe east to Russia and south to Madeira.

ASPLENIACEAE

Phyllitis scolopendrium. **Hart's-tongue.**



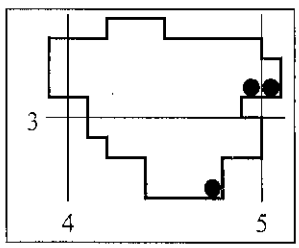
Seven tetrads (Hall 1980).

We also have recorded it widely around the edges of the Forest, often from masonry as in Forest Row, etc. It also occurs in the deeper damp ravines on the east of the Forest, and one plant was found in a road drain under the grill. It is widespread in Sussex and Britain.

This is a strongly western plant in Europe which likes mild, moist situations. It occurs on all substrates in the extreme west (e.g. western Ireland), but eastwards becomes increasingly confined to limestone and to sheltered, damp, wooded ravines where it is protected from drought and frost; even in Britain it may be defoliated in severe winters. Further east it becomes rarer still and in the Czech Republic it is protected by law.

Also found in Morocco, Macaronesia, the Middle East and Japan.

Asplenium adiantum-nigrum. **Black spleenwort.**

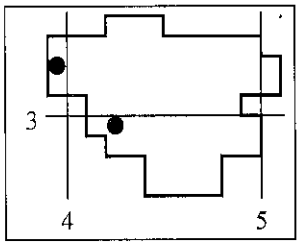


Five tetrads on the eastern side of the Forest (Hall 1980).

We only have three records in the same eastern area: lane east of Oldlands Hall entrance (475.268), 1995, TR; old wall of burst dam, Marden's Hill (495.319), 1995, TR; and wall of St John's Church (504.317), 1993+, PD *et al.* It tends to occur as small populations on the sides of lanes or on walls, and may be more widespread but overlooked.

Rarely frequent but widespread in Sussex and much of Britain (commoner in the west), and widespread in Europe, south-west Asia, the cooler parts of Africa and south-east America. It is less calcicolous and more shade-tolerant than our other *Asplenium* species.

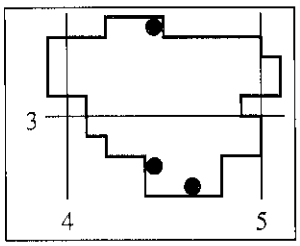
Asplenium trichomanes subsp. *quadrivalens.* **Maidenhair spleenwort.**



No tetrad records in Hall (1980), and only recorded by us from the bridge near Braberry Hatch (428.296), 1993+, TR & EL; more than 12 plants on wall on drive to Horncastle House (392.322), 1995, DB. (The 33V tetrad record in Briggs (1990) was from outside our Flora area).

Locally frequent and widespread in Sussex and much of Britain (commoner in the west), and widespread in Europe.

Asplenium ruta-muraria. **Wall-rue.**

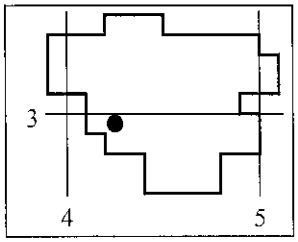


Tetrad 43H (Hall 1980).

West of Lines Farm, four plants on Medway bridge (442.349) and abundant in shaded cracks on old railway bridge (442.347), 1995, TR; Fairwarp Church (466.268) on the east side of the wall by the road, with four plants to the south of the gate, and twelve to the north, 1995, TR; Nutley Church (442.279), four plants to west of gate and twelve to east, 1995, PD.

Probably the most characteristic wall fern in Britain, and in eastern England where natural rock outcrops are rare, it is virtually restricted to them. Frequent and widespread in Sussex and much of Britain, and widespread in Europe, Asia and eastern North America.

Ceterach officinarum. **Rustyback.**

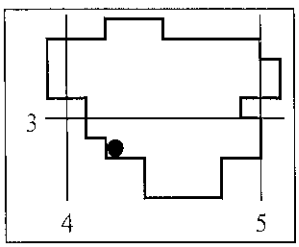


One plant on Brabies Gate Bridge at Braberry Hatch (428.296), 1993, DK, where it has been known locally since at least 1980. Care has been taken to look after it during repointing work on the bridge.

Uncommon in Sussex with more sites in West Sussex than East (Briggs 1990). Much commoner in western Britain than in the east where it usually occurs on calcareous substrates, but in the west is also found on other rocks. Markedly south-western in Europe, and also found eastwards to the Himalaya.

WOODSIACEAE

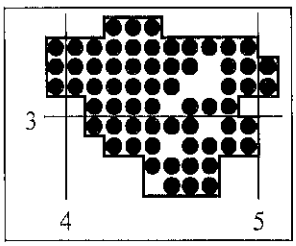
Onoclea sensibilis.* **Sensitive fern.



This is the only non-native fern recorded in the Flora area, and a large patch was found established on wet ground along the stream and by the pond in Maskett's Wood (428.285), where it was probably originally planted with other exotics. This is exactly the habitat in which it is naturalized in a number of widely scattered localities in Britain. In its native habitat in North America and eastern Asia it also occurs on wet ground, either in woodland or sometimes in the open.

It is called sensitive fern as it dies back after the first frosts.

Athyrium filix-femina. **Lady-fern.**



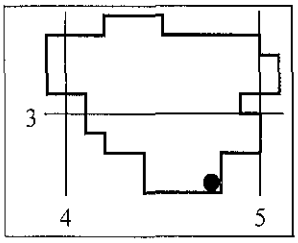
Ashdown Forest, and 'var. *rhaeticum*' was noted from the great bog near Kidbrook Park Pales, E. Jenner (Arnold 1887). Common on the Forests, W. B. Hemsley (Wolley-Dod 1937). Common on the Forest (Hall 1980).

We have found it commonly along stream sides and in damp ground, but it is rarely found in the open, and hence quite uncommon or absent on the higher ground squares in the east side of the Forest. Also absent from the intensively farmed area south of Nutley.

In Sussex it is locally abundant in the wooded areas in the north of the Weald on the sandstones, and is notably absent from the chalk and clay. It is widespread in Britain and the whole of the northern temperate zone, India, Java and South America.

DRYOPTERIDACEAE

***Polystichum aculeatum*. Hard shield-fern.**

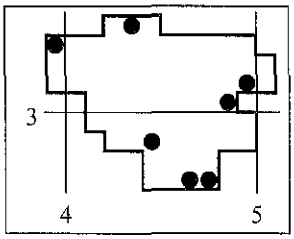


Tetrads 42T and 43H (Hall 1980), the latter may be outside the Flora area.

One plant in the sunken lane at Fairwarp (474.267), pH 4.3, 1995, PD, the same tetrad as Hall's 42T record.

Its occurrence in Sussex predominantly on sandy soils noted by Hall (1980) and confirmed by our record and observations of it on sandrocks outside the Forest contrasts with its ecology in Britain as a whole, where Jermy *et al.* (1978) note it requires a base-rich substrate, though it is certainly common on limestone and base-rich places in the north and west of Britain. It is quite widespread in Britain and western Europe, becoming rarer eastwards, also found in North Africa and Asia.

***Polystichum setiferum*. Soft shield-fern.**



Tetrads 33V, 42P, 43H and 43Z (Hall 1980).

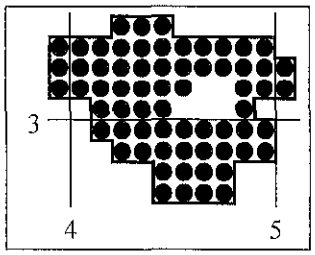
Our records are scattered around the edges of the Forest, where it either occurs as single plants on the north side at the Plaw Wood stream (390.332) and on the track at Rystwood (437.343), or more locally frequent along river banks in the deeper shaded gullies around Fairwarp and the stream east of Black Hill. It also occurs in abundance on the west side of the A22 cutting at Nutley (442.283), a dangerous place to record it.

Damp shaded stream sides on alluvial soils and sunken lanes are its usual habitat in Sussex where it can be locally common, but surely not restricted to base-poor soils as suggested by Jermy *et al.* (1978)?

It is a southern sub-Atlantic species of south and west Europe and other temperate areas which reaches its northern limit in Scotland. It occurs most frequently in south and west Britain where it is warm and wet in winter, and this may explain why it is commonest in our deeper wooded stream valleys and sunken lanes.

Both *Polystichum* species were noted as increasing in England by the BSBI Monitoring Scheme (Rich & Woodruff 1996) which may be due to relaxed cutting regimes in hedges (FR, pers. comm. 1990).

***Dryopteris filix-mas*. Male-fern.**



Common on the Forest (Hall 1980).

We have recorded it from most squares except the high open areas on the east side of the Forest.

It is one of the most common and widespread ferns in Sussex and Britain, with broad ecological requirements, though most abundant in woods and often in hedges. It is common and widespread in Europe, Asia, Madagascar and the Americas.

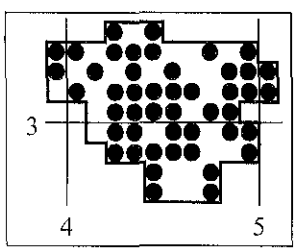
***Dryopteris affinis (D. borreri)*. Scaly male-fern.**

Common on the Forest (Hall 1980).

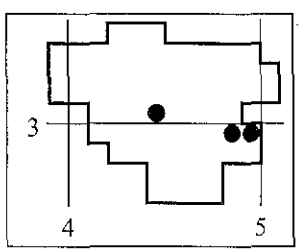
We recorded it less frequently than *D. filix-mas*, but it is none the less quite widespread especially on the poorer soils in wooded areas in the middle of the Forest, and sometimes on the hedgebanks. It is abundant in woodlands on the west side of lakes in Pippingford Park, but more often occurs as a few plants scattered here and there. In Britain it is much commoner in the west, and is also quite western in distribution in Europe.

D. affinis has arisen by hybridisation between *D. filix-mas* and the montane *D. oreades*, but reproduces from spores produced asexually so distinctive forms may be locally frequent. This fern is a taxonomic nightmare, and although three subspecies are generally recognised there may be at least eight taxa in the group. Rob Cooke has determined all our records for the subspecies, of which we have two: subsp. *borreri* is the commonest one and tends to occur on the more fertile soils, whilst subsp. *affinis* is much rarer and occurs on the more acidic soils. Subsp. *cambrensis* is western in Britain and is unlikely to occur here. The maps of the subspecies are obviously incomplete.

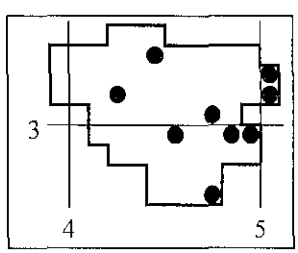
Dryopteris affinis



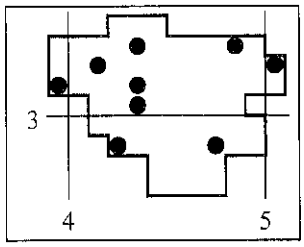
subsp. *affinis*



subsp. *borreri*



***Dryopteris aemula*. Hay-scented buckler-fern.**



Wood at Old Sands, Maresfield, R. A. Pryor (Wolley-Dod 1937), but probably not our area. Ghyll at Duddleswell (458.283) until dislodged by small boys sliding down the bank, 1950s, DS. Frequent on the Forest (Briggs 1990).

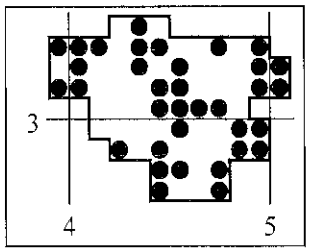
Found almost always scattered as small isolated populations in the deeper ravines by streams. A typical place to find it on the Forest is on the lower half of a steep, north-facing bank in a shaded gully, on deep, damp soil, mixed with *D. dilatata*. The lighter green, crinkly foliage which curls upwards and the deep purple stipe easily distinguish it at a glance once it is known, and the glands on the fronds are useful as confirmation with a lens. The hay scent is much stronger when plants are dried. The details of all our records are as follows: one plant by stream, Horncastle Wood (394.315), 1994, TR & DB (near an old FR site); six plants in ghyll, Hindleap Warren (411.328), 1994, TR; two sites in woods at Chelwood Corner (422.288 and 426.288), PH et al., 1994; about 300 plants in top of ghyll in Pippingford Park (438.309), 1995, Flora meeting; one young plant in ghyll, Southbank Wood (432.315), 1995, TR; seven plants on stream fork near old pond, Broadstone Warren (430.332), TR & NM, 1994 (an old DS/FR site); more than 70 plants in ghyll east of Duddleswell Manor (472.285), quite frequent in lightly shaded areas, 1995, TR & G. M. Kay; about 15 plants on side of cut drainage channel to pond, Five Hundred Acre Wood (488.332), 1995, PW; seven plants on north-facing bank, Keyward's Wood (502.325), 1994, TR *et al.*

FR has made a detailed study of this species in the Weald (Rose 1958), and now has details of over 120 sites. The two critical factors affecting its distribution appear to be micro-climate and substrate. It most frequently occurs in steep-sided, sheltered ghylls where the humidity is higher and the summer temperature lower than the surrounding ground, and is usually on north-east- or north-facing rocks and slopes though it may occur on south-facing slopes in very sheltered positions. The soils are always well-drained but acidic (pH 5.0-5.5), on either massive sandstone or stony or rocky banks. It most often occurs under oak and beech, but will not tolerate dense shade from holly or yew, and is rarely found in coppiced woodlands probably because it cannot survive the periodic disturbance and high light intensity.

It might be imagined that it would be a relict woodland plant, but the colonisation of drainage ditches indicates that it can spread into new ground, and it has also been reported on relatively recent drainage ditches in the New Forest (FR, pers. comm. 1992).

Britain and Ireland hold most of the world population of this species, which is a very western, oceanic plant. It also occurs in the Canaries, Madeira and Azores, the north Spanish coast, and north-west and south-west France. The Wealden populations are the most easterly in Europe, and it is locally more abundant here than in other parts of its range such as North Wales.

***Dryopteris carthusiana (D. spinulosa)*. Narrow buckler-fern.**



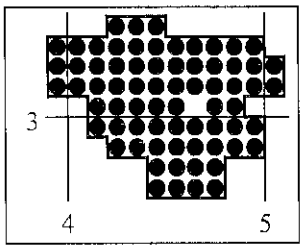
Ashdown Forest, W. Borrer (Arnold 1887). Ashdown Forest (**BTN**). Common in Ashdown Forest (Hall 1980).

As one might expect of this plant of wet woods on acidic soils, most common in the valley bottoms and in flushes, and sometimes locally abundant as at Newbridge. It occasionally occurs out on the open heath as near Poundgate.

The erect growth form and boggy habitat of this fern distinguishes it from *D. dilatata*. Both species grow together at Newbridge in the alder woodlands but we have not looked for the hybrid which is supposed to be quite frequent where the parents meet.

It is scattered in the Weald and is widespread in Britain. It is also quite widespread in North America and Europe but is rare in the south. Wet heathland and bogs are very typical habitats for it in western Britain and Ireland.

***Dryopteris dilatata*. Broad buckler-fern.**



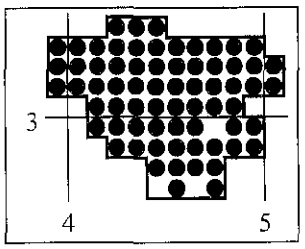
Ashdown Forest, 1895, E. H. Farr (**BTN**). Common on the Forest (Hall 1980).

This species is probably the second most frequent fern on the Forest after bracken. It occurs in woodland, sometimes out in the open in wet boggy areas, and on roadside banks. It is surprisingly absent from the Old Lodge square where it has been specifically looked for. In 1995, a gall which causes the fronds to roll at the tips (possibly *Dasineura filicina*) was frequent. Young plants have uniformly pale brown scales and could be mistaken for *D. carthusiana*.

Very common in the Weald but rare on the chalk, and quite western in distribution in Europe, and also in temperate Asia. Possibly increasing in England (Rich & Woodruff 1996).

BLECHNACEAE

***Blechnum spicant*. Hard-fern.**



On the forests, abundant, E. Jenner (Arnold 1887). Ashdown Forest, 1897, T. Hilton (**BTN**). Very luxuriant in Crowborough Warren (Done 1914). Common on the Forest (Hall 1980).

Our records also show it is widespread but rare or absent from the clays along the southern edge of the Forest. This matches the pattern in Sussex where it is clearly shown to be a calcifuge like *Athyrium,* avoiding the chalk and the pure Weald clay (Hall 1980).

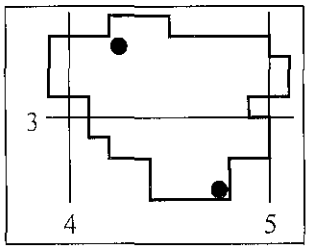
Common in western Britain and Europe and becoming rarer eastwards. It also occurs in Morocco, Japan and western North America.

Gymnosperms

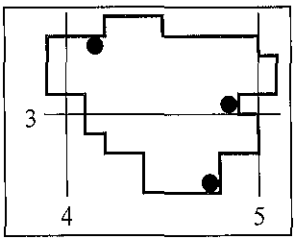
Forestry trees are widely planted around the edges of the Forest, but there seems little point in recording them except where they regenerate naturally from seed, usually in or by their plantations. The records we have are shown on the maps, but they have probably not been recorded as systematically as other species. Christmas trees are often planted out on the Forest but they rarely survive for long.

The only conifers of special note are the *Sequoiadendron giganteum* and *Sequoia sempervirens* planted in 1984 near Cripp's Manor (401.319), Goat Cross-roads (401.325) and Lavender Platt (401.334) on the Meridian Line which runs through the Forest; these were apparently chosen to contrast with the other trees when seen from the air (*AFN* 30:5).

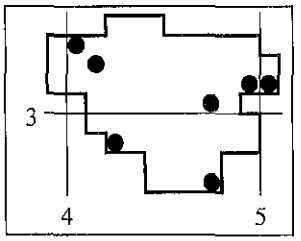
***Pseudotsuga menziesii*.**
Douglas fir.



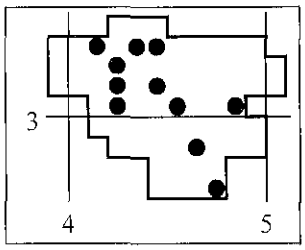
***Tsuga heterophylla*.**
Western hemlock-spruce.



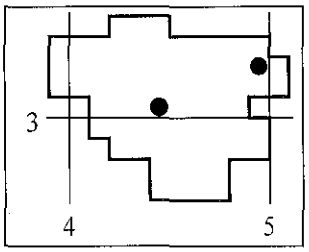
***Picea abies*.**
Norway spruce.



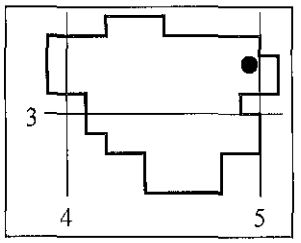
***Larix decidua*.**
European larch.



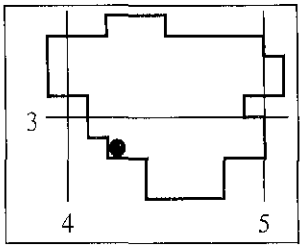
Larix x marschlinsii (L. x eurolepis).
Hybrid larch.



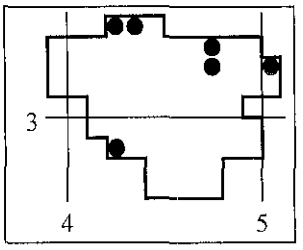
***Larix kaempferi*.**
Japanese larch.



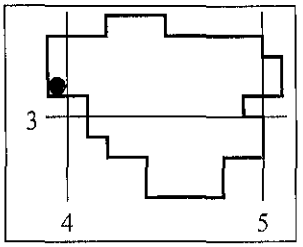
***Pinus nigra* subsp. *laricio*.**
Corsican pine.



***Chamaecyparis lawsoniana*.**
Lawson's cypress.

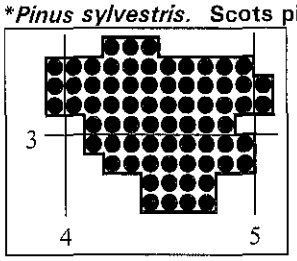


***Thuja plicata*.**
Western red-cedar.



PINACEAE

***Pinus sylvestris.* Scots pine, Scotch fir.**



In William Raper's notebook 1878-1879, John Brooker, born 1806 near Coleman's Hatch, gave the following evidence "When I was a boy there was a toll of full grown Scotch fir called the Mount but with that exception there are no firs on the Forest. In after years tolls of young Scotch fir were planted on the Forest". Abundant on the Forests (Done 1914). Common on the Forest (Hall 1980).

Some of the hilltop clumps were (reputedly) planted in 1825 probably as landscape features. The clump at Gills Lap, once composed of 63 or 64 trees, for many years was also known as 'The Camel' because of the shape of its silhouette (*AFN* 29: 21). More clumps have been added recently. It is now virtually ubiquitous across the Forest and regenerating freely. There are often small groves of saplings near the clumps and these may grow to become a serious problem for management if not controlled whilst they are still small.

Pines are often badly affected by fires, and are killed by the fiercer blazes. Many trees were lost in the Great Storm and the timber sold for building (*AFN* 15: 2-4). 'Scotch fir up to 5 ft' are sold from the Forest Centre as Christmas trees and do not lose their leaves until Easter (*AFN* 28: 5-6) - one 36 ft tree even starred in Siegfried at the Royal Opera House (*AFN* 28: 20-21). Some trees were also transplanted to beside the lake at Hever Castle 12 miles away (*AFN* 18: 17).

The trees are the European lowland race and not the native Scottish form. Crossbills sporadically nest in Scots pine in the Forest, and eat the seeds from the cones. It is widespread in Europe and temperate Asia.

CUPRESSACEAE

***Juniperus communis.* Common juniper.**

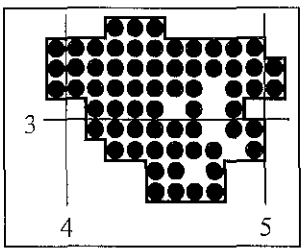
On Ashdown Forest, very scarce (Coleman 1836). Not recorded since and probably extinct. Juniper was last seen in the Ashdown Forest area on the southern edge of Stumblewood Common (outside the Flora area) by FR in 1945 but it probably became extinct soon after and could not be found by FR and DS in the mid 1950s. This Stumblewood Common site and 'Juniper Wood' west of Nutley were searched again in 1995 without success. One plant at Coleman's Hatch church is unlikely to be a descendant of the Forest junipers, as the church is quite recent.

Junipers on lowland heaths have declined enormously in general in lowland Britain due to changes in land use. Ward (1973) recorded 26 extinct sites in Sussex and 50 post-1960 sites half of which had only ten or fewer bushes. There were only four extant sites in the Weald including one at Tunbridge Wells. They remain locally frequent on the South and North Downs but often clustered in small populations. They are sensitive to fire, and appear to have very particular requirements for seedling establishment.

Widespread in Europe, though mainly in the mountains in the south. Also in North Asia, North Africa, Himalaya and North America.

TAXACEAE

***Taxus baccata.* Yew.**



Crowborough, 1790, T. Woolgar (Wolley-Dod 1937). "Common. Certainly indigenous on Ashdown Forest" (Coleman 1836). Common on the Forest (Hall 1980).

Yew trees are widely scattered around the Forest, and there are some quite large ones especially on boundary banks. They are also found in hedges, for instance at Newbridge (456.325) and a yew hedge has recently been planted at the Forest Centre. Lower branches under two metres from the ground are regularly nibbled by deer, especially in the winter, and there are noticeably few young trees in some places. The trees are usually separate sexes, and a count of 53 medium to large yews in Broadstone Warren in 1995 by PW found 20 (38%) with berries. The numbers of fruits varied enormously between trees, and fallen berries carpeted the ground under some trees. The berries are elegantly known in Sussex as 'snotty gogs' (Grigson 1955), and older Forest residents have mentioned that as children they used to suck the fruits for the flesh and spit out the (poisonous) seeds. In Sussex there is a tradition that it is unlucky to fell yews. Some yew timber blown down in the 1987 storm was sold for carving (*AFN* 15: 2-4). Yew Tree Farm and Yew Tree Hall take their name from the tree.

The group of yews at Yew, the Duddleswell road junction (471.288), originates from the custom of planting three to indicate farms willing to accommodate overnight drovers and their cattle; two yews indicated accommodation for the men only. One of the three yews blew down in the 1987 storm; the first replacement died during a dry spell, a second got pulled up, a third was too spindly and fell over, and a fourth died in the 1995 drought (*AFN* 28:1).

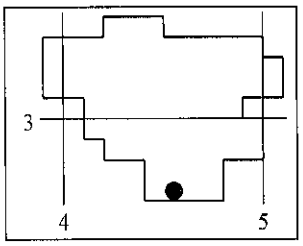
The churches around the Forest have planted yews, but none have the very ancient yews for which some churchyards such as Crowhurst in Sussex are famous. Alan Mitchell, the great authority on trees, suggested these were often present before the churches were built. Yews simply seem to be present in churchyards for the tradition of winter greenery, and were not planted for making long bows - the best staves were apparently imported from Spain or Italy.

Scattered as a native in Britain and increasing possibly due to planting (Rich & Woodruff 1996), scattered in Europe, the Middle East, Himalaya and the mountains of North Africa.

Angiosperms

LAURACEAE

***Laurus nobilis.* Bay.**

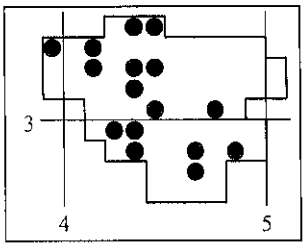


Seedlings were found on a path and verge outside a garden near a bush at Cackle Street (452.266), 1995, RN & ER.

This widely used pot herb is occasionally established in the wild in sheltered locations in Britain. As a native it occurs on the limestone along the Mediterranean coast and possibly the Atlantic coasts of Portugal and Spain, and is often now confined to inaccessible rocky cliffs.

NYMPHAEACEAE

***Nymphaea alba.* White water-lily.**



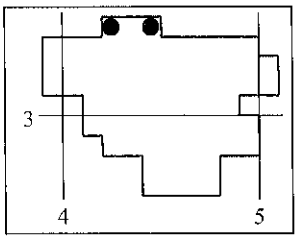
Cackle Street, 1933, G. Dent (Dent 1928-1953). Tetrads 42U and 43K (Hall 1980).

Probably native in some localities in Sussex, but our records are probably always of lilies planted in ponds and lakes. Sometimes the flowers are pink, as at Braberry Hatch and many other locations, and sometimes white as at Mill Wood, the pond by Ridge Road, and Ellison's Pond. During the 1995 drought some ponds dried out leaving whole plants exposed on drying mud; they seem to have survived quite well although a few were eaten by deer.

The water in the ponds is often quite murky and dark, and the only other species to grow with it at all frequently is *Potamogeton natans*. The poor nutrient status of the ponds on the acidic soils probably also suits this species compared to *Nuphar lutea*, and indeed smaller *Nymphaea* plants, sometimes distinguished as a separate subspecies, are widespread in the acidic poor waters of lochs and lochans in the north and west of Britain and Ireland.

Widespread in Britain and Europe, though rare in the far north.

***Nuphar lutea.* Yellow water-lily, Brandy bottle.**



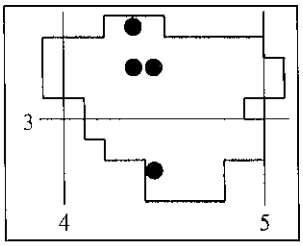
Forest Row, Miss P. Stockdale (undated but c. 1910-1916; **BEX**). Still known in this area, with large patches possibly planted in a lake at Forest Row (421.347), 1995, TR, and probably native as non-flowering submerged leaves in River Medway east of Forest Row (441.349), 1995, TR & PA.

This water-lily tends to occur in more nutrient-rich, calcareous waters than the white water-lily, and is often also found in deeper and running water. As well as the floating leaves it has submerged ones which are not best suited to muddy water, and its absence from the Forest ponds may be due to their generally murky nutrient-poor water; it could also be absent because it has not been introduced.

Common and widespread in Britain and Europe, though rare in the far north.

CERATOPHYLLACEAE

***Ceratophyllum demersum.* Rigid hornwort.**



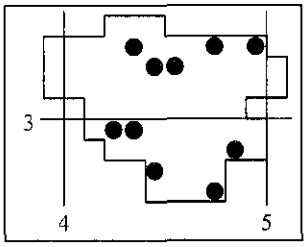
Pond on the edge of the golf course at Forest Row (437.342), 1994; pond by Ridge Road (448.329), 1995; mucky pond by farm at Pricketts Hatch (443.270), 1995; north side of pond at Ashdown Park (431.320), 1995, all found by TR with a grapnel.

This species floats freely in the water just below the surface, and can occur in open conditions or lurk under dense mats of duckweed, as at Prickets Hatch, where it seems to be quite shade-tolerant, an unusual characteristic for a water plant. It often occurs in nutrient-rich water, and is often abundant in arable areas where there is high inorganic nitrogen in the water, probably from fertiliser run-off (Goulder & Boatman 1971). The widespread increase in eutrophic water due to fertilisers may have resulted in an increase in this species in the lowlands.

Occasional but probably under-recorded in Sussex (Briggs 1990 had about twice as many records as Hall 1980). Few botanists regularly carry a grapnel or are prepared to use it in smelly, dirty water, a potential habitat for both the hornwort and Weil's disease. Widespread in Britain, Europe, North Africa, Asia and North America.

RANUNCULACEAE

Caltha palustris. **Marsh-marigold, Kingcup.**

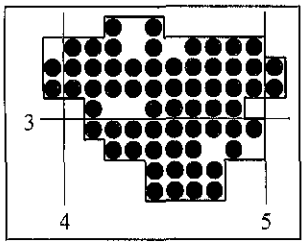


Recorded in six tetrads in Hall (1980).

We have it in seven 1-km squares most of which match Hall's except for two tetrads on the west side of the Forest, and also introduced at Chelwood Vachery around the spring (432.297). It is mainly found in the alder woods around the edges of the Forest (e.g. Newbridge) but it is surprisingly rare; one might have imagined that it would be frequent in the wet, acidic flushes around the Forest.

Widespread in the Weald, Britain and Europe, but decreasing in England (Rich & Woodruff 1996). Also in temperate and arctic Asia, and North America.

Anemone nemorosa. **Wood anemone, Drops of snow.**



Quite widespread on the Forest, even in open situations on road verges and with bracken away from woodland - the verges and banks on the B2026 around Fairwarp are lined with patches, the white drifts most noticeable on sunny days in April. It may also be present in at least some of the squares we have not had access to in the spring.

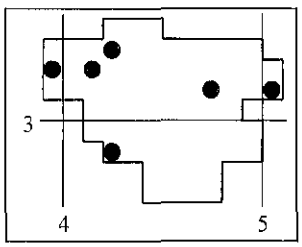
Wolley-Dod (1937) notes that plants with lavender-coloured flowers (var. *caerulea* DC.) were recorded by Talbot from Ashdown Forest. Occasional patches with blue-, pink- or purple-flushed petals can now be found quite widely; blue-flowered plants were found by Goat car park, RN (these went purple when dried), PR reported one very striking patch at Shepherd's car park with magenta petals coloured on both sides (var. *purpurea* DC.) amongst normal white patches, and var. *purpurea* was also seen in woodland south of Londonderry Farm (446.289), 1982, ER. Plants with flowers of both colours occur at Maskett's Wood. As plants spread to form patches by rhizomes under the soil, sometimes different clones grow together and can be distinguished by the slightly different shapes of leaves.

Wood anemones are shade-tolerating rather than shade-demanding, and will grow quite successfully in the open. They grow best on moist to wet soils where the air humidity is high, and this is why they are most frequently found in woodland or shaded areas (Shirreffs 1985). Where the climate is dry they are almost confined to woodlands (e.g. Lincolnshire), but where it is damper they are less restricted (e.g. Derbyshire). They grow best on soils of a relatively heavy texture (e.g. clayey or silty), although they will tolerate a range of soil conditions. The suitability of both the damp climate and the silty soils may help explain their frequency in the open on Ashdown Forest.

Although they contain a bitter poison, anemonin, which discourages grazing, they may have decreased since the decline in grazing on the Forest due to the spread of bracken. They can tolerate light fires. The open conditions after the 1987 storm caused some patches in woodland to flower better (*AFN* 15: 2-4).

Common in Sussex (Hall 1980), and widespread in Britain, Europe and western Asia.

****Clematis vitalba.*** **Traveller's-joy, Boy's bacca, Tom bacca, Old man, Old man's beard.**

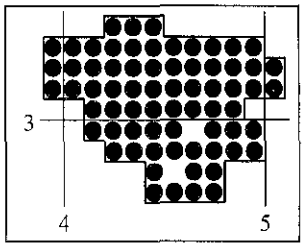


Recorded in tetrad 33W and 43A in Hall (1980), but the latter is probably in 43B by Warren car park where there is an old conspicuous plant on the north side of the road.

We have six records mainly from hedges and urban areas where it has escaped from cultivation, for instance hedge at Horncastle (390.324), 1995, TR; Warren car park (416.320), pH 6.8, 1993, TR; scrambling over trees in young woodland, Tompset's Bank (425.339), 1995, PW; verge opposite Quarry car park (470.319), 1993, PW.

In Sussex it is common and widespread on the chalk, with a few records from the Weald (Hall 1980). It is widespread on chalky soils in lowland England, Europe, the Caucasus and North Africa.

Ranunculus acris. **Meadow buttercup, Crowfoot, Goldcup, Kingcup.**

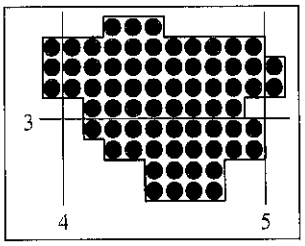


Common on the Forest (Hall 1980).

We have recorded it widely on the Forest on verges and in meadows, especially in damper areas, but it is rarely abundant. It avoids the more acidic soils. It appears to be reasonably resistant to herbicides but is often reduced in frequency where they have been applied.

It is widespread in Britain and temperate and arctic Eurasia.

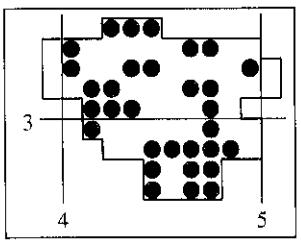
Ranunculus repens. **Creeping buttercup, Crowfoot, Goldcup, Kingcup.**



Ubiquitous in Ashdown Forest. It is often found in the richer, disturbed places, and like *R. acris* avoids the acidic soils. The grassland plants often differ from the finer, smaller plants found in wet flushes in woodland around the Forest, and it is known to be a very variable species, even within populations (Coles 1977).

Found throughout Europe and Asia.

Ranunculus bulbosus. **Bulbous buttercup, Crowfoot, Goldcup, Kingcup.**

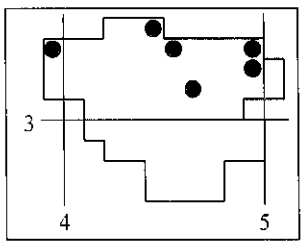


Common on the Forest (Hall 1980), with many additional records from the Weald in Briggs (1990).

Locally frequent on road verges and in unimproved meadows around the Forest, flowering just before creeping buttercup and a slightly different colour; if in doubt the reflexed sepals should be distinctive (but see *R. sardous*). Also rarely found on rides and grassy areas amongst heather as near Stone Cottage, 1995, AK.

It occurs throughout Europe and locally in western Asia and North Africa.

Ranunculus sardous (R. hirsutus). **Hairy buttercup.**

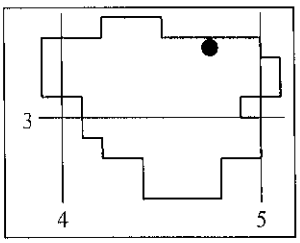


Fisher's Gate (Wolley-Dod 1937). Tetrads 33W and 53B (Hall 1980). Tetrads 43H and 43W (Briggs 1990) and locally frequent on the moist Ashdown Sands.

This species is quite characteristic of pastures on the clays and arable land in the Medway Valley, where it may be locally abundant. There were large populations near Friars Gate in 1987/88, and in 1991 one horse-grazed field was a sea of yellow so it is presumably not eaten like the other buttercups. Our records are mainly from the edge of the Medway valley, with one plant on a verge near Gills Lap. It is rather like *R. bulbosus* with its reflexed sepals, but it flowers for a longer period, has more yellowy-green leaves and has a few tubercles on the fruits (absent in *R. bulbosus*).

Most frequent in west and central Europe, also in western Asia and North Africa.

Ranunculus sceleratus. **Celery-leaved buttercup.**

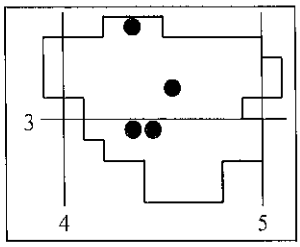


Pond by road, Tile Barn Farm (477.335), 1993, MM (the 33W tetrad record in Hall 1980 may be from outside our area).

This species is very characteristic of damp mud on the edges of ponds, or sometimes trampled marshes in fields, and is beautifully adapted to its temporary habitat. It is a summer annual or less often a winter annual, and can even produce two generations in a field season. It can form a persistent seed bank, and germination is enhanced by fluctuating temperatures and exposure to sunlight. The plants can flower and die within two months, some producing up to 56,000 seeds. The achenes adhere well to animals and birds, and can also float for several days to aid dispersal to nearby habitats (Grime, Hodgson & Hunt 1988).

Widespread in Britain, Europe, Asia, North Africa and North America.

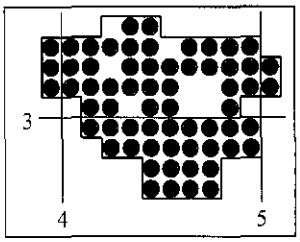
Ranunculus lingua.* **Greater spearwort.



Around pond at spring at Chelwood Vachery (432.297), 1994, TR; one plant introduced with other aquatics to a pond on the golf course, Forest Row (437.342), found on 14 August 1995 and destroyed when pond cleared out the following day, TR & PW; introduced by A. Morriss to Pippingford Park under pontoon bridge (449.297) and at small pond (453.316), 1995, TR.

This plant of water margins and pond edges is currently spreading in Britain (Rich & Woodruff 1996), presumably from plants thrown out of gardens. It is an uncommon native of fens. It also occurs in Europe (rarer in the south) and in Asia.

***Ranunculus flammula* subsp. *flammula*. Lesser spearwort.**



Wet places in many habitats, common (Hall 1980).

Quite common on wet rides, around ponds and in flushes in meadows and woodland, and often where there are some nutrients, but not in eutrophic places. Exasperatingly absent from a number of the higher, drier squares such as Gills Lap to Kings Standing (we have looked). Able to tolerate ferrous iron and often in such flushes.

Common in Britain and Europe, but decreasing in England (Rich & Woodruff 1996). It also occurs in temperate Asia and the Azores.

***Ranunculus ficaria*. Lesser celandine.**

One of the earliest species to flower, and locally abundant on roadsides, in woodland, on stream banks, etc., the bright yellow flowers opening widely in sunshine. The mild winter and wet of 1994/5 was beneficial for its growth and there were excellent displays in spring 1995. We have searched the Forest for it specially in March and April, and most of the squares which lack records probably lack the plant, although we have not had access to all land at the right time of year. The leaves go yellow and are harder to find by end of May, and are usually gone by July.

Widespread in Sussex, Britain and Europe. Sell (1994) distinguished four subspecies in Britain, of which three occur in our Flora area. They are best distinguished by flower size and the presence or absence of axillary bulbils (best seen after flowering as they can be very small and overlooked before). We have attempted to map them wherever practical.

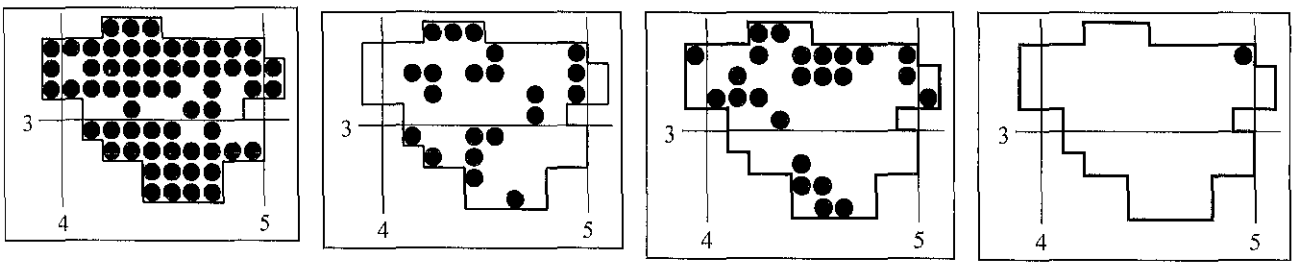
i) **Subsp. *ficaria*** has small petals usually to 15 mm on the Forest (to 20 mm elsewhere) and lacks bulbils. It is widespread around the Forest and edges, often as scattered plants. Judging from the records it is about as common as the following subspecies.

ii) **Subsp. *bulbilifer*** also has small petals usually to 11 mm and has bulbils in the leaf axils from which it regenerates, and often forms large patches in woodlands, gardens and waste ground (e.g. behind the telephone box at Wych Cross, 419.319). Most of the records are from around the edges of the Forest and in urban areas.

iii) ***Subsp. *chrysocephalus*** has petals to 23 mm (flowers 47 mm diameter) and lacks bulbils. It was found on dumped soil near the Half Moon (498.334), 1995, TR, the first record for Sussex, and it looked very big by comparison with the other two subspecies. It appears to be native in the east Mediterranean region, and could be widespread in British gardens,

A double-flowered garden form (taxon unknown) was found dumped and established by School Lane, Nutley (443.280), 1995, TR & JK.

Ranunculus ficaria Subsp. *ficaria* Subsp. *bulbilifer* Subsp. *chrysocephalus*



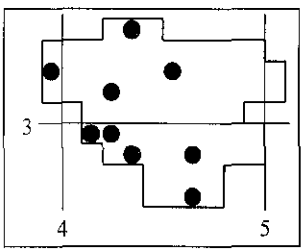
***Ranunculus hederaceus*. Ivy-leaved crowfoot.**

Marden's Hill, E. D. Morgan (Wolley-Dod 1937). Tetrads 42T and 43K (Hall 1980).

Alas, we have not refound this plant on the Forest, and it seems to be quite rare now in Sussex. It is a strongly western oceanic species occurring from southern Sweden to Spain, and is endemic to Europe.

It can be distinguished from the following species by the leaves which are widest above the base and petals usually less than 4 mm (leaves widest at the base and petals usually more than 5 mm in *R. omiophyllus*). It usually grows in similar wet muddy places, often where they are disturbed and open.

***Ranunculus omiophyllus (R. lenormandii)*. Round-leaved crowfoot.**



Nutley 1851, J. Weaver; Ashdown Forest, C. E. Salmon; near Crowborough, E. Ellman (Wolley-Dod 1937). Tetrads 42J, 42N, 43A, 43L and 43R (Hall 1980).

Shaded stream north-west of Cripps Manor (398.321), 1995, AK; Chelwood Gate area (41.29), 1995, MM; mud by stream near Ashdown Park (428.319), 1993, TR & EL; three sites along the main stream (i) shaded mud, Braberry Hatch (428.296), 1993, TR & EL, (ii) Mill Wood (437.288), 1994, ER, RN *et al.* and (iii) alder wood Newbridge (455.323), 1993, TR & PD; marshy pond in Toll Lane woodland (461.262), 1993, TR & NM where it has been known since 1983 AFRR; Duddleswell, shady stream by footbridge (467.283), 1995, RN & ER; Forest Row, recently cleared pond (436.342), 1995, TR & PS.

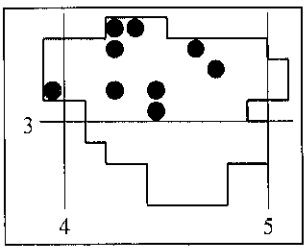
Our records are generally from mud in shaded habitats and possibly for good reason. Cook (1966) notes that in Britain its distribution follows the 8 cm August rainfall isohyet, and it is absent from much of the drier central and eastern England; our shaded sites may be those which remain cool and damp enough for it in the summer. Elsewhere it occurs on

wet mud, small streams, ditches and ponds, often in temporary water, and in open and disturbed habitats (Webster 1988). It may grow in more base-poor, oligotrophic habitats than *R. hederaceus* in Britain, but overall the habitats of the two species overlap (Cook 1966).

The flowers are usually pollinated in bud before they open (Cook 1966). The flowering heads produce an average of about 38 achenes per head, which are either pushed down into the mud by the pedicel (as in *R. hederaceus*) or may be dispersed in water where they float for up to 3.5 days (Salisbury 1970).

In Sussex it mainly occurs in St Leonard's and Ashdown Forests (Hall 1980). It has a very restricted distribution in western Europe, being reasonably widespread in western Britain and Ireland where it is very characteristic of rills and stream heads at moderate altitude (Rodwell 1991), western France (Brittany and Normandy), Spain, Portugal, southern Italy and Sicily. It also occurs in the coastal mountains of Algeria.

Ranunculus peltatus. **Pond water-crowfoot.**



Recorded in tetrad 43L in Hall (1980).

The only water-crowfoot currently known in the Forest, occurring in ponds and also in running water in the stream from Pippingford Park, though we were unable to find it in the lakes themselves. It completely covered the pond at Wrens Warren (47.32) in 1995, PW, and was reported to have been brought in by ducks. Plants from Boringwheel Mill Farm (45.26) were recorded as *R. aquatilis sensu lato*, and probably also refer to this species.

It occurs in shallow water and on drying mud, where the water levels fluctuate. Seeds germinate in the autumn and plants flower from May onwards. It is often found in temporary or disturbed habitats, but sometimes occurs in more permanent water. It is widespread throughout the lowland British Isles, but absent from much of Scotland and parts of Wales and Ireland. It is also found in most of Europe and North Africa.

The water-crowfoots are notoriously difficult to identify, and the best identification guide is Webster (1988). The characters used to distinguish this species from the following are: the pedicel in fruit longer than the petiole of the opposing leaf, and petals 11-22 mm with a pear-shaped nectar pit (pedicel in fruit shorter than the petiole of the opposing leaf, and petals less than 10 mm with a circular nectar pit in *R. aquatilis*). If in doubt collect flowering/fruiting plants for verification.

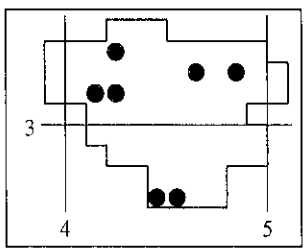
[*Ranunculus aquatilis,* common water-crowfoot, was recorded in tetrads 43K and 43L in Hall (1980), the latter recorded also for *R. peltatus*. We have found no records during our work although it is more a plant of ponds, and assume that as these species have been regularly confused in the past the records are in error; we would welcome voucher specimens demonstrating otherwise!]

Myosurus minimus. **Mousetail.**

Formerly in great abundance in a cornfield near Wych Cross, Mr Turner (Deakin 1871). The same record in subsequent publications reads "Formerly abundant at Wych Cross, E. Jenner" (Arnold 1907) and "formerly abundant in a cornfield at Wych Cross, Furness in *Flora of Tunbridge Wells*" (Wolley-Dod 1937). We assume this site is to the east of Wych Cross in what is now the Ashdown Forest Farm, recently home to rare breeds but not rare plants. It is now very rare in East Sussex, and confined to south and west England but widespread in central and southern Europe, south-west Asia and North Africa.

Mousetail is generally an annual of fertile broken ground which may be trampled and seasonally wet, and occurs in the edges of arable land, riverbanks, poached gateways and tracks. It is still found in the New Forest in this type of habitat, and could have occurred as a native in a similar habitat on Ashdown Forest too. It is somewhat salt-tolerant and even occurs on roadsides (it was found in abundance on the heavily salted Peterborough ring road in 1987, TR & DE). It is sporadic in appearance, and appears to be declining, especially in its former arable sites (Chatters 1994).

****Aquilegia vulgaris.*** **Columbine, Two-faces-under-a-hat.**

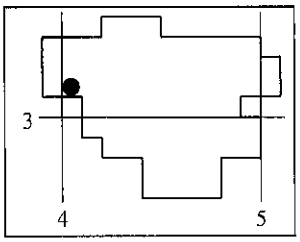


Tetrad 33V (Hall 1980), probably not in our area and not native.

All our records are garden escapes which occur near gardens on dumped rubbish. The flowers vary in colour from pink to white and purple, and none are the deep blue native form.

As a native it seems widespread in chalk and limestone areas in England and Wales but never common. It is widespread in western Europe, where its taxonomy is more complex; a comparison of native and introduced plants might help clarify the status of many populations.

Thalictrum aquilegiifolium. **French meadow-rue.**

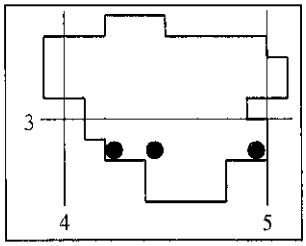


Planted with other garden plants near Smockfarthing (401.319), 1994 but gone by 1995, TR.

Widely grown in gardens in Britain, and sometimes established (e.g. since 1949 in Tunbridge Wells; Clement & Foster 1994). A native of south-east Europe and strongly continental in distribution, and possibly not spreading successfully in our climate.

BERBERIDACEAE

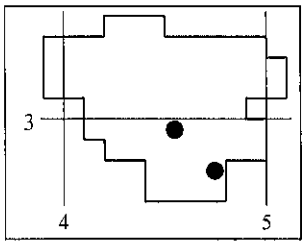
Berberis thunbergii. **Thunberg's barberry.**



A Japanese native which is mass-planted on landscaping schemes and widely grown around gardens - the thorns are useful for keeping burglars out. We have three records all from near houses where it has probably been bird-sown and has flown the nest, but is well established.

None of the native Barberry (*Berberis vulgaris*) has been found, and is now very rare in Sussex.

Mahonia aquifolium. **Oregon-grape.**

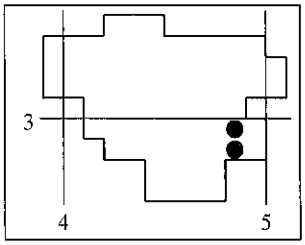


Old planting in hillside woodland with laurel near Old Lodge (45.29), 1995, TR; seedling on wall of old garden, Oldlands Hall (47.27), 1995, PD *et al.*

Widely grown in gardens and spreading into the wild, especially in south-east England. Native in western North America.

PAPAVERACEAE

Papaver somniferum **subsp. *somniferum.*** **Opium poppy.**

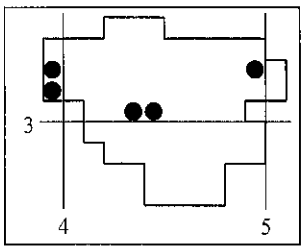


Tetrads 42N and 42T (Hall 1980).

We have two records from dumped soil on a roadside at Poundgate (48.28) in 1994, and a casual on a track near New Pond Cottages (48.29) in 1995, both Flora Group meetings.

It is widely established in Britain as a casual which does not persist for long, although it does seed prolifically and can recur in subsequent years. It is increasing in England (Rich & Woodruff 1996), and originates from Turkey. The ornamental garden plants produce very little latex of interest.

Papaver rhoeas. **Common poppy, Red-weed.**



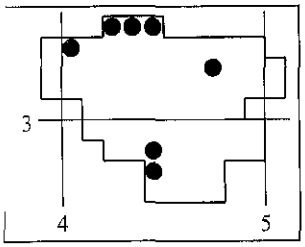
Tetrad 42J (Hall 1980).

We have five scattered records, mainly from dumped earth or newly disturbed road verges as there is so little arable land in our Flora area.

Poppies have made a resurgence in recent years due to set-aside land, and they can still turn some fields in Sussex red from long-dormant seed (e.g. Rich 1992).

Common and widespread in Europe, temperate Asia and North Africa.

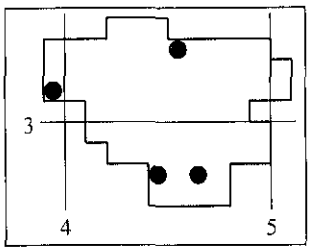
Meconopsis cambrica.* **Welsh poppy.



As a native this species occurs on moist, shady screes and rocky places, often under trees and usually on base-rich soils in hilly country in Wales and south-west England (Ellis 1994). However, it is also widely naturalized on roadsides, gardens, walls and waste ground elsewhere in Britain, especially in the west where the climate is damper. Paradoxically like many other rare native plants, it fruits profusely and spreads in gardens, but does not seem to spread in the wild.

We have recorded it mainly in the urban areas, especially Forest Row and Nutley where it is quite widespread in gardens. It is endemic to western Europe, and is rare in Wales, England, Ireland, central France and the Pyrenees and Spain, and introduced elsewhere.

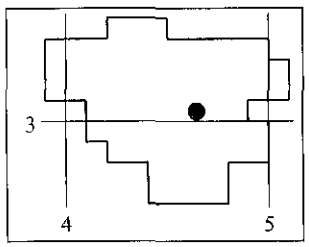
Chelidonium majus.* **Greater celandine.



Six tetrad records in Hall (1980), but we only have four 1-km square records. This species may be native in Britain, but is strongly associated with habitation in Sussex and was formerly cultivated as a medicinal herb.

Widespread in England and Wales, and in Europe and North Asia.

Eschscholzia californica.* **Californian poppy.

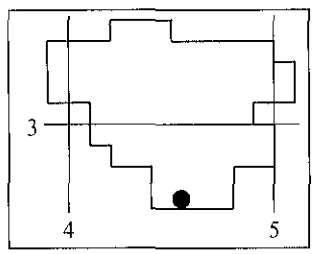


A few plants on new rubble in gateway, Old Lodge (461.309), TR, 1994 but gone by 1995.

It is regularly found naturalized or thrown out of gardens in southern Britain. Native of south-western North America, where for instance it grows on rocky shores.

FUMARIACEAE

Pseudofumaria lutea (Corydalis lutea).* **Yellow corydalis.

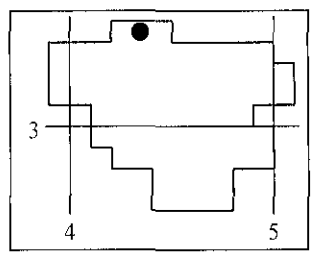


Tetrad 43V (Hall 1980).

Recorded once in woodland just off Cackle Street (453.263), 1995, RN & ER. It is also naturalized in Forest Row where it has been recorded since at least 1956 (BRC), but not yet recorded outside gardens in our Flora area.

It is widely grown in gardens and churchyards, and is naturalized on walls and in damp, calcareous places throughout Britain. Native in the foothills of the Italian Alps, but widely introduced in Europe.

Ceratocapnos claviculata **subsp.** *claviculata (Corydalis claviculata).* **Climbing corydalis.**



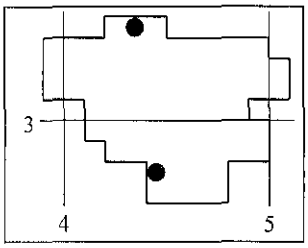
One substantial colony in secondary woodland on woodland edge immediately south-east of tee on Royal Ashdown golf course (c. 434.343), 1987, PS. The plants grew up to about 1 metre tall through the young scrub (by 1995 this had grown up quite markedly), and were visible at some distance. The Forest Row locality is a long way from the few other East Sussex sites. In Sussex as a whole it is a rare plant, usually on acidic soils of the Lower Greensand in West Sussex and on the Ashdown and Tunbridge Wells sands in the east.

An unusual species in being one of the few woodland annuals, and it may be very abundant in some years but virtually absent in others The seedlings germinate in the autumn and over-winter, usually flowering in May and often continuing into the autumn in wet years. It will tolerate quite dense shade but prefers more open patches and path edges. It also occurs on heathland with bluebells and wood anemones under bracken. Where such sites are planted with conifers it may once again become very abundant after clearance.

In Europe it is endemic with a very western distribution and it is restricted to five main areas from Denmark to northern Spain.

Fumaria bastardii. **Tall ramping-fumitory.**
Nutley, S. Morris (Wolley-Dod 1937), but not seen again. This species is still widespread along the west coast of Britain in gardens, fields, new road verges and disturbed soils (Pearman & Preston 1994), but appears to have gone from south-east England where it may only have been a casual. It is also predominantly south-western in distribution in Europe.

Fumaria muralis **subsp.** ***boraei.*** **Common ramping-fumitory.**



Tetrad 42N (Hall 1980), and apparently a predominantly East Sussex plant. Hedge near Ashdown Hotel (427.343), 1986, PS.

We have two post-1987 records; bank on north side of Clock House Lane, Nutley (444.278), 1994, PD & AK; disturbed soil in pasture (possibly from buried seed?), Forest Row (436.349), 1995, TR & PA.

Very western oceanic distribution in Europe predominantly in western Britain, France, Spain and Portugal.

Fumaria officinalis. **Common fumitory, Earth smoke.**
Tetrads 42N and 53W (Hall 1980). Tetrad 43A, 1987, AK, not refound.

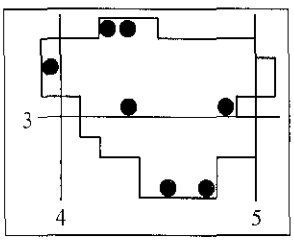
We have not recorded it, though it could reappear in the future. It is the commonest fumitory in Sussex and is widespread in Europe. It is mainly a casual of gardens, field edges and waste soil and is most frequent on the chalk in Sussex.

ULMACEAE

Ulmus. **Elms.**
The taxonomy of *Ulmus* is under review (Armstrong & Sell, in prep.), and *U. procera* is used here in its broad sense. Plants are best identified from the leaves on the short shoots in sunlit positions (these are often out of reach). The suckers are notoriously variable.

Sussex is still quite rich in elms after the latest ravages of Dutch elm disease, and many trees regenerated from suckers. *Ulmus glabra* seems less affected than *U. procera*, but there are a few resistant trees of the latter still around in the Weald (e.g. at Selborne in Hampshire, FR). Some counties such as Cambridgeshire lost whole woods, which are now recovering with a ground flora of nettles benefiting from the light and the nutrient release from the dead trees. In Sussex we have few pure elm woods, and most of our elms occur in hedges.

Ulmus glabra. **Wych elm.**



Tetrads 33W and 42T (Hall 1980); refound in both as well as new sites.

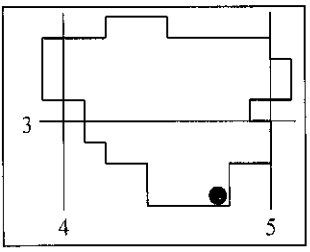
We have a few records of young trees mostly scattered around the edges of the Forest. One small tree and one sapling, Plaw Hatch Hall entrance (392.326), 1995, TR; young tree (c. 8 metres tall) on A22 verge opposite Trees car park (c. 434.304), 1995 which narrowly avoided having cars wrapped round it on at least two occasions in 1994/5 - this is near the main deer crossing point, DK & TR independently; three young trees to 6 metres in hedge by lane, Highgate (425.342), 1993, TR; one tree and two big saplings, Post Horn Lane in hedge on west side (435.346), 1993, TR (these plants approach subsp. *montana* with narrow leaves c. 2 x as long as wide rather than the more usual 1.5 x as long as wide); one young, trimmed tree in hedge south of Nutley (453.263) with regrowth leaves nearly the size of dinner plates (c. 22 cm x 15 cm), 1995, TR; tree in hedge with large leaves from regrowth (477.268), 1994, Flora meeting and 1995, TR; unlocalized in 48.30, Flora meeting, 1995.

Its rarity on the Forest may be due to the poor soils (it is usually most abundant at the bottom of slopes where the soil is richer and deeper), and to deer browsing as it is very palatable. It is occasional in Sussex except in the north-east (Hall 1980), and is widespread in Britain (more frequent in the north and west), Europe and north and west Asia.

Wych Cross is not named after the tree but is derived from the old English Wicg, meaning 'steed' or later 'beast of burden' - presumably they were changed at the top of the hill?

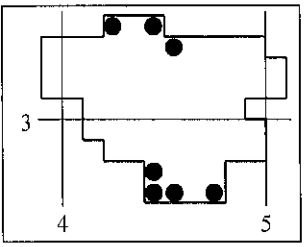
Distinguished from *U. procera* by the large, rough leaves with a short petiole, and not suckering hence our populations are usually 1-3 trees only.

***Ulmus* × *hollandica* (?*U. glabra* × *minor*, and possibly with *U. plotii* too). Dutch elm.**



One tree by road west of Oldlands Farm (475.267), pH 7.3, 1995, TR & G. M. Kay. The identity of this tree is not certain, but it differs markedly from the local *U. procera* in having big leaves and is suckering along the hedgerow.

***Ulmus procera*. English elm, Elven.**



Frequent on the south side of the Forest, and in 43L (Hall 1980).

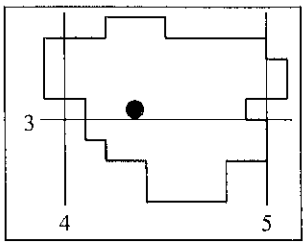
Small tree on east side of A22, Forest Row (424.349), 1994, RN & ER; frequent in Hollybush Wood (441.270) - our only woodland record where it occurs in both squares with many suckers, 1995, TR & PA; at entrance to Hunter's Farm (450.265) in hedges to west and south-east in several places along the A22, 1994/5, TR; four small trees by A22 south of the William IV (446.272); shaw near Boringwheel Mill Farm (453.263), 1995, TR; hedge east of Coleman's Hatch Church, including a large tree and many suckers (450.338), 1994, TR; hedge south of Holly Cottage (479.266), 1995, TR; unlocalized in 44.34, 1994, TR. The elms near Nutley appear to be one clone, but they may be different from the clone at Coleman's Hatch.

English elm usually likes rich soils on clays, consequently it is not found on the Forest, and similarly is uncommon in north-east Sussex (Hall 1980) where the soils are unsuitable. Common and widespread in Britain and Europe, and probably endemic.

For anyone interested in the history and ecology of elms, the chapter in Rackham (1986) is highly recommended.

CANNABACEAE

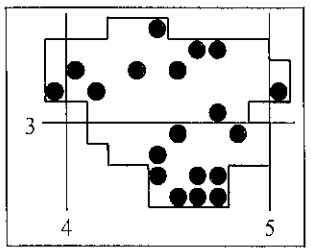
***Cannabis sativa*. Cannabis.**



One plant 15 cm tall on A22 verge by lay-by at entrance to Pippingford Park (437.303) oblivious to the traffic but it did not last long, 1995, TR & PA. Odd patches are reputed to be sown on the Forest but get eaten by rabbits.

Originally from Asia, and notably casual in Britain.

***Humulus lupulus*. Hop.**

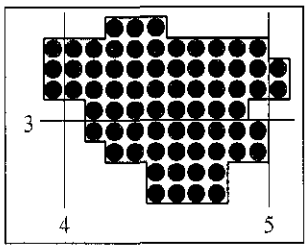


The cultural importance of this plant cannot be over-emphasised. 'Hopped ale' or beer was first brewed in England in the fifteenth century, and was initially regarded as adulterated. It was accepted when the resinous compounds in the hops helped to preserve the ale longer in warm weather (Drummond & Wilbraham 1939). The hops were first imported from the continent, but by the sixteenth century hop gardens were well established in the High Weald and even supplied the London markets (Warren & Alford 1994). The number of oast houses around the county indicates the large areas devoted to hops, and some are still grown today although the quantities have dropped dramatically due to imports. Weak beer, mead and cider were once essential as drinks, the brewing process purifying unclean water.

There are eight tetrad records in Hall (1980), and we have also recorded it quite widely, mainly from road verges and hedges. The name "Cackle" Street may be derived from "cockle", a seventeenth century term for a hop drying kiln. To judge from the oast houses still present in Nutley, Toll Lane and Fairwarp, hops were grown around the southern edge of the Forest, and our records are presumably mainly from colonist plants rather than relicts of cultivation (plants at Wych Cross reservoir and opposite Wood Reeves car park are female). As a native it probably occurred on rich alluvial soils along rivers, where it still occurs today. The native distribution in Britain and Europe has been much obscured by planting, but it was probably widespread. It also occurs in western Asia and North America.

URTICACEAE

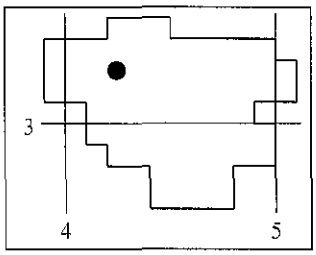
***Urtica dioica*. Common nettle, Stinging nettle, Naughty man's play thing.**



Ubiquitous in both Hall (1980) and our survey, but the maps do not reveal that it is largely absent from the heathy areas as it prefers rich soils with high phosphate and nitrogen concentrations. The rich soils result in high nutrients in the plant which would make it highly palatable were it not protected by the stinging hairs. Nonetheless many insects eat it, and patches of nettles often provide shelter for other palatable herbs such as *Galium aparine*. Common and widespread in Britain, Europe and temperate Asia.

Nettle pollen is a common cause of hay-fever late in the season, when its pollen is one of the commonest in the air (Rich 1994b). Young plants have been blanched or eaten as spinach, and the leaves have been used as a herbal tea.

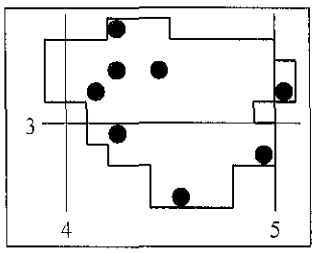
***Urtica urens*. Small nettle.**



Five tetrad records in Hall (1980), but only recorded once at Wych Cross Nursery (420.320), 1993, TR, where it wasn't supposed to be for sale!

Small nettle is commonest on sandy soils, and probably has not persisted on the rather moist, silty Ashdown soils. It is widespread but not common inland in Britain, and it is widespread in Europe.

****Soleirolia soleirolii*. Mind-your-own-business.**

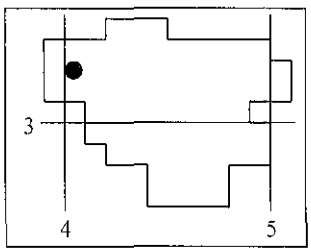


We have eight records from damp ditch sides or masonry, and also noted it introduced with soil on the footpath across Broadstone Warren. It is quite well established in damp places on walls, gardens and churchyards in south-west Britain and Ireland and is increasing (Rich & Woodruff 1996).

As a native this is a rare endemic of a few islands in the west Mediterranean, though we tend to dismiss it without a second thought. It is rarely introduced elsewhere in Europe.

JUGLANDACEAE

****Juglans regia*. Walnut.**



Planted near Goat cross-roads (40.32), 1993, but not naturalized. Good fruit was set locally in 1995.

Scattered in Britain and increasing (Rich & Woodruff 1990). Native in south-east Europe and central Asia to China.

MYRICACEAE

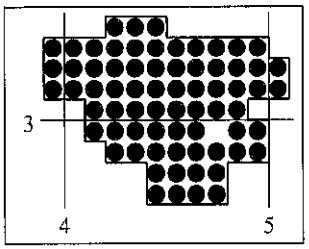
[*Myrica gale*. Bog-myrtle, Sweet willow, Sweet gale.

Ingwersen (1951) noted "a few miles east on Ashdown Forest it was so plentiful that a whole hill has been called after it "Gale Hill". Gale Hill, with the years, has been corrupted into "Gallow's Hill", and people are apt to think that a gallows once stood there. That may be indeed, but gale leaves a sweeter memory".

We have no idea as to the origin of Ingwersen's comment as *Myrica* has never been confirmed from the Forest. We have seen no trace of Gale Hill or Gallow's Hill, though the settlement at 413.307 was once called The Gale. The nearest *Myrica* records are "bogs of the Gaghl, Gaggle or Gargle Wood (388.339), which takes its name from the plant, retaining the ancient guttural pronunciation" and "The Bottoms, May's Farm" (388.341) (Coleman 1836) just outside the Flora area but both are long gone, and from Buckhurst Park, Withyham (tetrad 53L; Hall 1980). It is a rare plant in bogs where there is some lateral water movement in south-east England, though frequent in the New Forest and locally dominant in the north and west. It mainly occurs in north-west Europe and North America.]

FAGACEAE

***Fagus sylvatica*. Beech.**



Found in the Forest Row tetrad where it was missing in Hall (1980), and certainly missing from only one square in our survey where there are virtually no trees, 1995, AK.

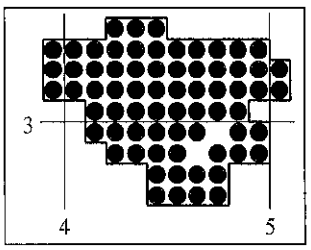
Beech is very widespread as younger trees in secondary woodland, but rarely as a pioneer tree in open heathland. It is also planted in hedges, some of which still show signs of having been laid, as outside Kidd's Hill Farm (461.319). Large beech trees are very characteristic of the Forest Pale, forming a series of Gothic arches along the edges of the Forest. Many were blown over during the 1987 storm and other blustrous days, and the timber was sold for furniture (*AFN* 15: 2-4). Many of the boundary beeches have been replanted. In 1995, possibly a consequence of infection with a fungus after the storms, two trees shed whole branches which blocked the A22 on Kidbrooke Hill. The drought in 1995 resulted in many trees losing their leaves early. Some large trees in Broadstone Warren and Five Hundred Acre Wood are old pollards, and may be home to owls and other animals.

Beech mast may have once an important source of food for pigs on the Forest, the right of pannage (Jenks 1967), but the are few records of this right being exercised and the only wild boar reported recently was an escaped pot-bellied pig (*AFN* 28: 20-21). The hot dry summer of 1995 was a very good year for beech mast, although the grey squirrels tried to eat the seeds before they were ripe. The mast is edible by humans too, but patience is required to remove the shell. There were authorised sales of beech tips (i.e. shoots) by the Wood Reeve presumably for flower arranging. Beech Hill and High Beeches House are local names.

Salisbury (1942) suggested a reason for mast years, and pointed out seedlings of beech "only persist in Britain in mast years when the number of the progeny is so large that after the depredations of field mice and other enemies there still remains a residue that survives, whereas in the intervening seasons between the mast years, the seedlings are entirely destroyed by their natural enemies. It is indeed not improbable that a pronounced fluctuation in numbers of offspring may have a definite survival value, since an intermittent high reproductive capacity, owing to the lag in increase in predators and parasites, might well increase the abundance of a species whereas a reproductive capacity maintained at the same high level would have little or no effect, since the plant enemies would likewise be maintained at a high level".

Our subsp. *sylvatica* is endemic to western Europe.

****Castanea sativa*. Sweet chestnut.**



Hindlip Warren, Ashdown Forest (Coleman 1836). Ubiquitous in Hall's (1980) tetrads, and only missing from two of our 1-km squares (like beech, we have looked for it). Chestnut Farm is near Nutley.

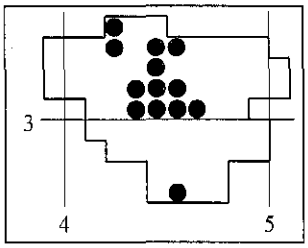
There are many commercial plantations around the Forest, and plants self-sown or apparently so are frequent outside the plantations ranging from young saplings to quite large trees. Deer may browse off the regrowth after coppicing (Craddock 1953). It does not seem to have naturalized elsewhere where cultivated in Europe, and the invasion of British woods seems to be unique (Rackham 1986). Part of its success may be because there are few insects which eat it - virtually no galls are known in Britain (Imms 1947), and it supports relatively few invertebrates (Hill, Roberts & Stork 1990). The sweet-smelling, whitish catkins adorn the trees like candelabras in July and attract numerous insects.

It is probably native in Italy and the Balkans, and possibly Spain. It has been cultivated since Roman times in Britain possibly originally for the timber as the best nut-bearing varieties from Italy were not introduced. By the Middle Ages it was naturalized and recorded with oak and beech, the then typical trees of acidic soils. From the seventeenth century onwards there were many plantations in Kent and Sussex providing coppice wood and long poles for the hops (Rackham 1986), though Coleman's sole record suggests that the Ashdown chestnut woods are quite recent. Chestnut is cut on a 15 year cycle, and there are regular authorised sales of chestnut from Ashdown Forest. The main use today is for the characteristic Sussex chestnut paling, and charcoal is again becoming popular.

On the whole, the dense chestnut plantations of Hindleap Warren, Five Hundred Acre Wood and so forth are uniform and botanically dull. The dense chestnut stools allow very little light through to the ground and the thick persistent litter smothers the ground. Even bluebells may be scarce under the thickest chestnut, though the tracks between coups may be home to treasures such as *Wahlenbergia* and *Hypericum humifusum* which tend to appear sporadically for a few years after the stands have been coppiced. Some chestnut plantations on the Forest are now being replaced with native species.

Chestnuts are still collected locally and are at their best roasted on an open fire. Microwave ovens assist in the laborious task of peeling the outer layers for use in cooking.

***Quercus cerris.* Turkey oak.**



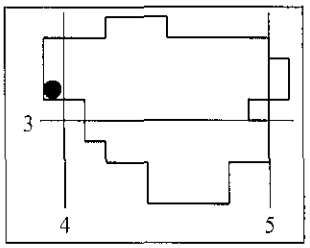
Five tetrad records in Hall (1980), only one of which matches our records. We have recorded it mainly in the Pippingford Park - Old Lodge area as trees with occasional saplings, and as isolated trees elsewhere.

It is widely planted for timber and grows rapidly. In some areas of Britain it is very invasive and may be as common as the pedunculate oak, but does not appear to be spreading significantly on the Forest. It is an introduced species in Britain, but occurs naturally from southern Europe eastwards to Asia.

Turkey oak is easily distinguished from the other oaks by the acorn cups which have long hairs or scales. The leaves are hairy and very variable, ranging from shallowly to deeply lobed. It hybridises with pedunculate oak elsewhere in southern Britain, but hybrids have not yet been recorded in our area.

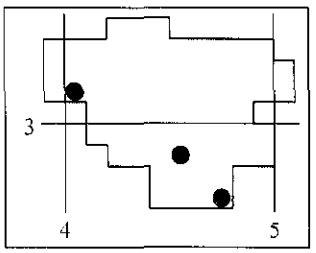
No knopper galls (caused by the insect *Andricus quercusalicis*) have been noted in 1993-1995 on the Forest - the epidemic of the 1980s has come under control naturally by parasites and parasitoids (*Q. cerris* is the secondary host).

***Quercus ilex.* Evergreen oak.**



One mature tree in woodland from Twyford area (394.311), 1995, DB but no seedlings noted. This species is native in southern Europe, especially on limestone, and is becoming naturalized in similar places in Britain (e.g. Isle of Wight, Torquay). Fortunately it is frost sensitive and rarely invasive inland or on acidic soils and is unlikely to invade the Forest, though it is increasing in England (Rich & Woodruff 1996).

***Quercus petraea.* Sessile oak.**

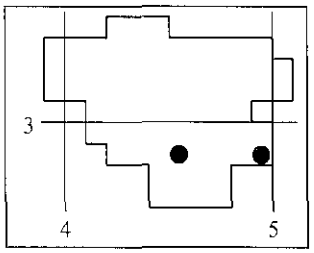


In wood between Hartfield and Forest Row, E. Forster (Wolley-Dod 1937) but probably outside our area. Four tetrads in Hall (1980) but none match our records and surely over-recorded?

The main population on the Forest occurs in the ghyll west of Duddleswell (458.284), where it may be relict from the original woodland cover. There is also a record from near Goat cross-roads, 1987, PW (which could not be found in 1993-1995) and trees grow outside the Forest at Furnace Wood (473.262) where they are quite frequent and are regenerating. Elsewhere in Sussex it is scattered across the Weald, generally on acidic soils and in rocky woods.

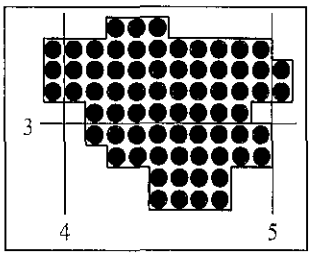
Sessile oak differs from pedunculate oak by having many shallow lobes on the leaves, and acorns on stalks usually less than 2 cm long. It is commonest in western Britain but is widespread on the Continent.

***Quercus* × *rosacea (Q. petraea* × *robur).* Hybrid oak.**



Hybrids between the pedunculate oak and the sessile oak have mixed characters from both parents, and where to draw the line between them is a matter of opinion (see Rich & Rich 1988). Good examples of hybrids have been recorded at Duddleswell with both parents (458.284), and the edge of Moulden Wood near Poundgate (497.283). Hybrids are well known in Britain and Europe, and may occur with or without parents.

***Quercus robur.* Pedunculate oak.**



Ubiquitous in both Hall (1980) and our survey, and widespread in Britain and Europe. This is the commonest oak on the Forest, and has leaves with 4-6 deep lobes on each side, and acorns on stalks more than 2 cm long. It is also one of the commonest trees, often invading heathland as well as being a natural component of the woodlands. It is very common in Sussex, Britain and Europe.

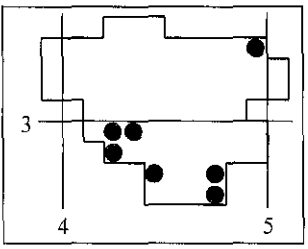
Oak has probably always been an important product of the Forest - though its current abundance is primarily due to the absence of grazing - and it was protected from the right of estovers. Oaks were widely used for charcoal for the blast furnaces (Coleman's Hatch may refer to 'cole', or charcoal) and were an important source of income and revenue on the Forest (see *AFN* 22: 3-4 and 23: 5-7). Acorns, with beech mast, may have been important for pannage for pigs and piglets, and they were collected to be fed to pigs by Mrs E. Vernon of Horney Common (pers. comm. to MR). Many large trees were blown over during the 1987 storm when one third of the 1500 acres of high woodland was lost, and the timber was sold for veneer and hardwood frames (*AFN* 15: 2-4). Some large trees may even have nests of wild bees.

A special large oak at Chuck Hatch, the Holy Oak (473.331), sheltered open air chapel meetings in the early 1900s (*AFN* 22: 9). This used to be in a completely open area on the edge of the Forest, but is now surrounded by dense woodland. Oak Plat and Lone Oak Hall are local names.

On 24 April 1995, a severe frost in an otherwise very mild spring caused many oaks to be frosted just as they were coming into leaf and flower - those on slopes and on open areas seemed worst hit. Many trees were still brown a month later, but slowly recovered and put out new leaves which were very variable and quite uncharacteristic in shape, ranging from very deeply lobed to others reminiscent of *Q. petraea* (and indeed could have easily been recorded for it or the hybrid in error). Similarly, acorn production in these frosted plants was very low in an otherwise excellent year for acorn production (one frosted tree at Strood Green, West Sussex only produced one acorn, TR). Such frost damage is quite frequent in some parts of Europe and causes the trees to grow slowly, giving a dense, hard, much-valued wood, but seems quite rare in Britain.

There are also other causes of leaf loss - for instance in about 1990, tortrix moths did a lot of damage to oaks on the Forest, and defoliated some completely at Friar's Gate; under the trees it rained caterpillars (B. Hoath & A. Main, pers. comm. 1995).

***Quercus rubra*. Red oak.**



This oak is easily distinguished by the large leaves with long teeth, which turn a brilliant red in autumn. It occurs naturally in North America, and is widely planted in Britain, either for autumn colour, or as a broad-leaved forestry tree. The records we have are for planted trees around Chelwood Vachery, the golf course at Forest Row, Wych Cross, Nutley, Fairwarp and Friar's Gate, but no seedlings or saplings have yet been reported. Increasing in England (Rich & Woodruff 1996).

BETULACEAE

***Betula*. Birches.**

"A heath, with here and there a few birch scrubs upon it, verily the most villainously ugly spot I ever saw in England", 1822, W. Cobbett; some things do not change, but there is now more birch.

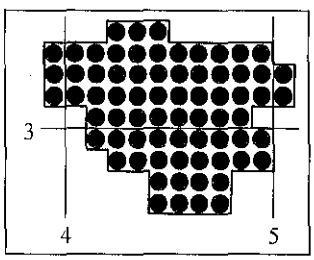
Birch from the Forest used to be an important source of domestic and commercial fuel, one of the rights of estovers which is still exercised by a few commoners. Faggots were used for brick-making, and some even for making brooms. Broomyard still remains as a name in Forest Row, the yard still being in operation until well after the last war. Birches figure widely in names on and around the Forest - Birch Grove House, Birch Wood, Birchfield Farm, Great Birch Wood and The Birches. In the 1990s, branches were cut by permit and woven into baskets and containers and examples were on show at the Forest Centre. Arnold (1907) gives a recipe for birch wine made from the sap, which is still made locally and apparently is potent!

The ecology of both birch species has been described by Atkinson (1992). They have broad climatic tolerance in Britain although in Europe *B. pendula* is more southerly and *B. pubescens* more northerly. In general, *B. pendula* occurs on lighter drier soils and *B. pubescens* on wetter ones, but both have a broad tolerance on Ashdown Forest (as in eastern England) though *B. pubescens* is solely dominant on the wettest soils over *Sphagnum* and *Molinia*. On the Forest both birches are quick to colonise bare areas even on nutrient-poor soils (pHs measured were 2.3, 3.4 and 3.5) and regularly need to be cleared from the heathlands. They have regenerated particularly well after the storms, and there are many dense thickets with impenetrable stands of birch, especially associated with rushy flushes. However the trees are intolerant of shade and although growing rapidly are eventually overtaken by more shade-tolerant, slower growing species such as oak, which in turn is replaced by beech.

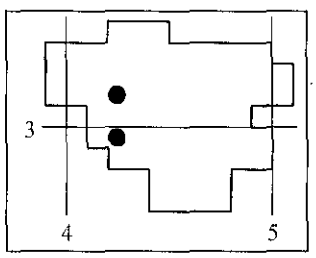
The two species can be told apart from the leaves, though both are quite variable (avoid leaves from suckers or shaded conditions). *Betula pendula* has quite triangular leaves with teeth on the teeth, and young twigs rough with many resinous warts. *Betula pubescens* has hairy, more rounded leaves with single teeth, and often hairy twigs.

Birches are the main cause of spring hayfever in people sensitive to tree pollen (Rich 1994b).

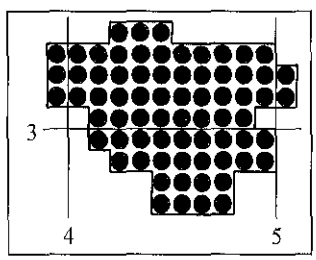
Betula pendula



Betula × *aurata*



Betula pubescens



Betula pendula. **Silver birch.**
Common on the Forest (Hall 1980). We have recorded it in every square but it is not as frequent on the ground as *B. pubescens*. Common and widespread in Sussex, Britain, Europe Asia Minor and Morocco.

The name *pendula* comes from the habit of the leading shoots of some trees drooping or pendulous to one side - how then do the trees grow upright?

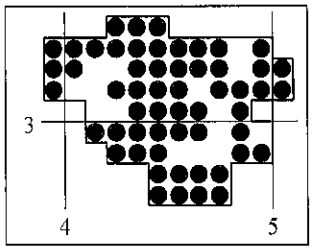
Betula* × *aurata (B. pendula* × *pubescens). **Hybrid birch.**
This hybrid has been recorded twice as intermediate plants, but these really require more detailed study and verification from chromosome counts; they could be quite frequent.

Betula pubescens* subsp. *pubescens. **Downy birch.**
Common on the Forest (Hall 1980). Again we have recorded it from every square, and it is common and widespread on both dry and wet soils on the Forest.

Branches on quite a number of trees succumbed to the drought in 1995, and trees with dead leaves were quite frequent.

Common and widespread in Sussex, Britain, Europe and north-east Asia Minor.

Alnus glutinosa. **Alder.**



Common on the Forest (Hall 1980).

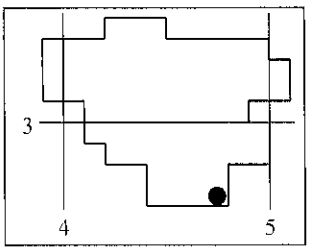
Widespread in the old woodland areas and along the main rivers but absent from the higher and drier areas. This may be because although the seeds require high light conditions for germination, the seedlings are susceptible to drought so they only establish in damp, open places (McVean 1955). No evidence of the disease causing die back in the canopy of alder (*BSBI News* **68**: 47) has been noticed up to 1995.

The alder woodland at Newbridge is a superb if somewhat treacherous habitat, where coppice stools occur down an extensive set of iron flushes on the slope. The woodland has many unusual plants of restricted occurrence but the wood itself may be quite young (Plate 2). Alder is one of the few trees deer do not eat, and the woodland may have colonised largely since the grazing was removed. A 20 year coppicing cycle is now being revived with superb results (*AFN* 27: 11-12).

Alder is cut from the Forest for estovers by the commoners. It makes very good charcoal and may have been used to fuel the first British blast furnace at Newbridge (now only marked by a pond bay at 454.325). It was also the main source of charcoal for gunpowder (Howkins 1994).

Common in Sussex, Britain, Europe, western Asia and North Africa.

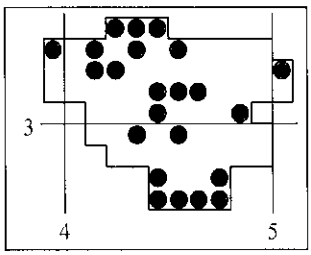
****Alnus cordata.*** **Italian alder.**



One tree c. 7 metres tall on woodland edge south-east of Fairwarp Farm (473.265), possibly planted but in an odd place, TR, 1994.

As a native this is a rare tree of Corsica, southern Italy and Albania, but is increasingly planted as a street tree or for landscaping in Britain.

Carpinus betulus. **Hornbeam.**



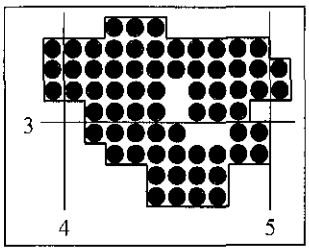
Common on the Forest (Hall 1980).

Recorded quite frequently but rarely in abundance around the Forest, sometimes as planted trees, or in hedges as for instance at the entrance to Broadstone Warren, banks in Pippingford Park, or the boundary bank on the south side of Chelwood Vachery. There is old hornbeam coppice in the northern part of Furnace Wood, and the trees cast dense shade in which little grows.

A continental species also recorded in Asia Minor which is accepted as a native in south-east England, and certainly typical of the acidic soils in the Weald. Hornbeam is very shade tolerant, and old understory coppice stools can grow to dominate the canopy. It can also be pollarded.

Hornbeam is one of the strongest timbers, and it burns with the greatest heat and with the brightest flames (Howkins 1994). The timber was highly valued and London was once encircled with hornbeam (Epping Forest, Ruislip and Hoddesdon Woods are the only major areas to survive). Its charcoal was used in furnaces.

Corylus avellana. **Hazel.**



Recorded in 91% of the tetrads in Sussex (Hall 1980), and we have it in most of our squares except a for few remote heathy areas. Also common and widespread in Britain, Europe and Asia Minor as it probably has been for the last 10,000 years. The name 'Nutley' is presumably derived from hazel nuts.

It occurs widely in hedges (sometimes the hedges were double-planted with hazel on one side and hawthorn on the other) and also as an early colonist of heathland. It appears fairly catholic in its soil requirements and will occur on some quite damp soils. Many plants suffered badly in the drought in 1995 and the leaves curled and turned whitish before dropping early in August.

Hazels were once cut regularly in the woods around Nutley (e.g. Hollybush Wood) for bean poles by the locals, and the bluebells used to flourish. Now that this no longer happens, the woods have become very over-grown and dark and the bluebells have declined (J. Walters pers. comm. 1995). The young wands were also used locally in the late 19th century and up to the 1980s as a base for Christmas wreaths, and also for constructing small baskets to contain primroses or polyanthus in *Sphagnum* moss at Easter. Coppicing has been re-introduced to the woodland in Toll Lane with pleasing results (*AFN* 22: 18-19 and 25: 4-6). Hazel has long been an important crop in the countryside and there are at least four dozen ways in which the wood has been used (Howkins 1994).

Observations of the nutters in Horney Common indicate that collecting nuts has declined with the local bus service over the last 25 years - nuts falling on the lanes are now more likely to be run over by cars than squirreled away in pockets on the way to the bus stop. 1992 and 1993 were average years for nuts, 1994 had a very poor crop, and 1995 was the best year for many years.

Hazel nuts are an important food source for woodmice and dormice (e.g. *AFN* 26: 17-18), though dormice were last seen on the Forest in the 1980s.

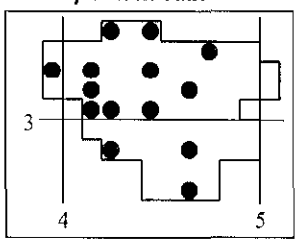
CHENOPODIACEAE

***Chenopodium bonus-henricus.* Good-King-Henry, Mercury goosefoot.**

Tetrad 42U (Hall 1980). Not found, and presumed extinct. This is an old pot herb which has fallen out of flavour, and is now declining. It usually occurs around old farms and near buildings in nutrient-rich places.

Widespread in Britain though now mainly in northern England, and probably native in central Europe and western Asia.

***Chenopodium rubrum.* Red goosefoot.**

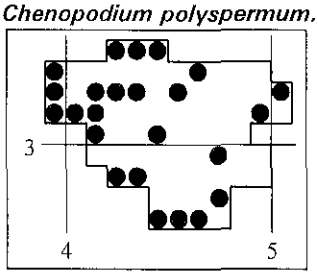


Occasional on the Forest (Hall 1980).

Scattered around the Forest. It is a classic nitrophile of nutrient-rich mud and dung heaps. It is also surprisingly frequent along the road verges beside the tarmac and some ecotypes may be salt-tolerant. Seed production ranges from 5 to over 500,000 seeds and depends on the size of the plant (Salisbury 1970).

Widespread in Sussex, though oddly rare in the west (Hall 1980), and predominantly south-eastern in Britain. It is increasing in England (Rich & Woodruff 1996). It is also widespread in central Europe but rare in the north and south. Also in Asia and North America.

***Chenopodium polyspermum.* Many-seeded goosefoot.**

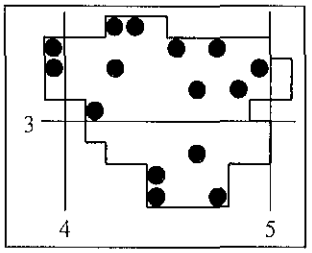


Frequent on the Forest, especially on the heavy soils (Hall 1980).

This is the prettiest of the *Chenopodium* species on the Forest, with the dark green leaves often edged in red, and a mixture of black, white, green and red in the inflorescence. Single plants occur scattered on waste ground and along road verges, and it is often found on woodland rides. It is generally more frequent on the Weald Clay soils than the Ashdown Sands.

In Britain mainly south-eastern in distribution from the Humber to the Severn, and only a rare casual elsewhere. It is widespread in Europe and Asia.

***Chenopodium ficifolium.* Fig-leaved goosefoot.**

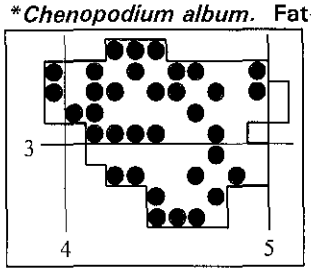


Tetrad 43K (Hall 1980).

We have many more records than Hall, but it rarely occurs as more than a few plants at a time in gardens, nurseries or on disturbed road verges. It has also been recorded occasionally in the road gutters with other *Chenopodium* species.

The *Atlas of the British flora* (Perring & Walters 1990) shows a strongly clumped distribution around London and in the Fens, but it has since either spread or is more widely known, having been overlooked due to its resemblance to *C. album* (Rich & Woodruff 1996). The oblong leaves with strong lobes are quite distinctive once seen, and the plant tends to be green and not whitish or mealy. It is scattered across central Europe but does not seem common anywhere (possibly under-recorded there too), and in Asia and North Africa.

Chenopodium album. **Fat-hen.**

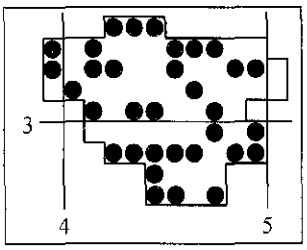


Frequent along the road verges in the gutters, also as a garden and arable weed and in gate entrances.

A variable plant with many forms which come true from seed. The seeds themselves are polymorphic; when the days are long the seeds produced are black and dormant, and when the days are short they are brown and can germinate immediately (Grime *et al.* 1988). This makes it a persistent weed which is very difficult to eliminate.

Recorded in 90% of the tetrads in Sussex (Hall 1980), and ubiquitous in Britain, Europe, Asia and Africa.

Atriplex prostrata (A. hastata). **Spear-leaved orache.**

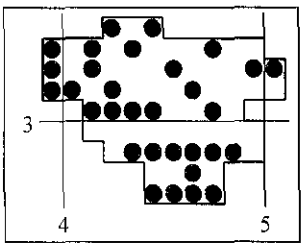


Frequent around the Forest (Hall 1980).

Often found growing in the edge of the grass at the margin of road verges, but less often in the gutters where the *Chenopodium* species occur. It frequently grows with the following species, though not in equal abundance.

Widespread in Britain but usually near the coast in the north. It may be a native species of coastal habitats. Widespread in Europe, Asia and North Africa.

Atriplex patula. **Common orache.**



Common on the Forest (Hall 1980).

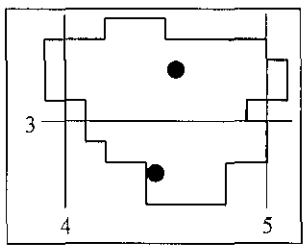
This species occurs on road edges, tracks, waste ground, in gardens and cultivated land, and in other disturbed places around the Forest.

Widespread in Sussex, Britain, Europe, Asia and North Africa.

[***Beta vulgaris*** **subsp.** ***vulgaris.*** **Sugar-beet.**
One plant on over-grown lawn, Horncastle House (392.323), 1995, DB, but scarcely naturalized.]

PORTULACACEAE

Claytonia sibirica (Montia sibirica). **Pink purslane.**

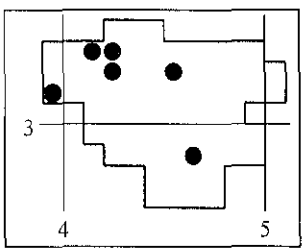


Tetrad 43L (Hall 1980). Tetrads 33V and 43Q (Briggs 1990). This increase in records may reflect a real increase in this invasive species as Wolley-Dod (1937) gave only one record for Sussex.

About 20 plants in willow scrub south-west of Yew Tree Farm, Nutley (446.275), 1995, TR; stream to south of Furnace Farm (452.324), 1995, Sylvia Priestly.

It was probably introduced as a garden plant. It is now widespread in northern and western Britain on river banks, lake shores and damp woodland, and it is increasing (Rich & Woodruff 1996). In Europe it is naturalized widely only in Holland. It is native in Siberia and western North America.

Montia fontana. **Blinks.**



Near Leg's Heath Gate (Coleman 1836). Ashdown Forest, 1890, E. H. Farr (**BTN**). Ashdown Forest as 'var. *minor*' (**TLS**), and Newbridge, C. E. Salmon as 'var. *erecta*' (Wolley-Dod 1937). Tetrads 42T and 43L (Hall 1980).

Horncastle Wood, several hundred plants in northern end of broad marshy ride (395.316), 1995, DB; one small patch on camp site in Broadstone Warren (422.323), 1995, Flora meeting; abundant on lawns at Old Cherry Cottage (41.33 and 42.33), 1987+, PS; abundant in wheel ruts, Newbridge (45.32), 1987, PW, not refound in 1994 or 1995; abundant in grassland by Ellison's Pond (462.287), 1995, RN & ER.

The two records we have checked using the pictures in Stace (1991) are subsp. *minor* (subsp. *chondrosperma*). This is the common taxon of damp grassland in south-east England, and both the previous varietal records may also have referred to this taxon too.

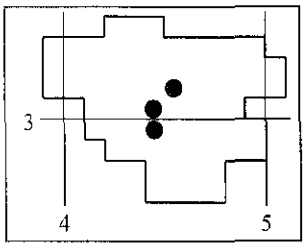
It is a winter annual which flowers in spring and early summer and has usually dried up and gone by July. Salisbury (1970) noted that seed from spring-flowering plants could germinate immediately and produce a second generation of

plants in the autumn; we have not recorded it doing so during our work. It is likely to reappear in areas where there is soil disturbance, for instance on woodland rides.

Montia fontana is very uncommon in Sussex but is widespread in Britain and temperate parts of the world. The common name is a modern invention, but is appropriate because the plant is so small that one blink and you miss it!

CARYOPHYLLACEAE

***Arenaria serpyllifolia* subsp. *serpyllifolia*. Thyme-leaved sandwort.**



Tetrad 43V (Hall 1980).

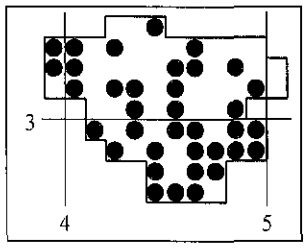
We have three sites in the centre of the Forest but do not remember specific details of any of them!

It is a winter annual and requires open sites and relatively high levels of soil moisture. It varies in abundance from year to year and is able to form a persistent seed bank.

Widespread in Sussex on calcareous soils and walls, but rare elsewhere and not on heavy or acidic soils. It is widespread in lowland Britain, Europe, temperate Asia and North Africa.

A. serpyllifolia subsp. *leptoclados* has been reported in tetrads 43H and 43M (Hall 1980). It is probably over-recorded in Britain in general and requires confirmation from measurements of the seed sizes (Rich & Rich 1988); it seems to be a plant of dry sandy ground in the Breckland, and TR has yet to see convincing material from anywhere else.

***Moehringia trinervia*. Three-nerved sandwort.**



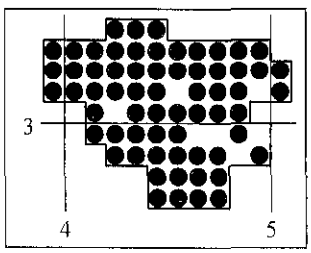
Frequent on the Forest (Hall 1980).

Most frequent in old hedges and woodland, typically on damp soils on banks, but widely distributed and with no strong distribution pattern.

Unusually for a woodland species, it is an annual which tends to exploit the slightly better illuminated and warmer sites in woods, though it may get droughted if the sites are too open (Grime *et al.* 1988). It is often in disturbed, open places in secondary woodland, and can form a persistent seed bank to exploit such temporary habitats. Leaf litter may prevent it becoming established on the general woodland floor.

Common in Sussex, and widespread in lowland Europe, western Asia and Siberia.

***Stellaria media sensu stricto*. Common chickweed.**



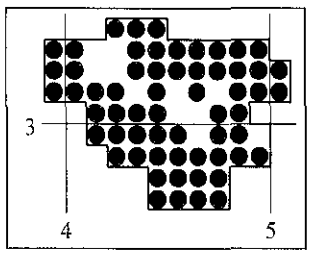
This species is a nitrophile and weed, often in gardens, dung areas in pastures and on rich alluvial soils on river banks. Most of our records are from roadsides or near habitation, and it is absent from the acidic, nutrient-poor areas.

Arthur (1989) gives a Sussex folk remedy for rheumatism as crushed chickweed laid on as a poultice.

Ubiquitous in Sussex in 98% of the tetrads (Hall 1980), widespread in Britain, Europe and the world.

There are no records for the segregates *S. neglecta* and *S. pallida,* but both could occur; the former is a rare plant of damp woodlands and the latter a plant of open, dry grassland.

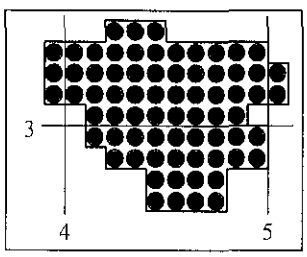
***Stellaria holostea*. Greater stitchwort, Brandy snap, Easter flower, Miller's star, Snapper flower, Snowflake, Star-flower.**



Frequent on the Forest on the richer soils. It occurs in the hedges, verges and hedgebanks around the Forest edges and in the older woodlands, but is absent from the heathy areas and there are oddly few records in the Hindleap and Broadstone areas. Grime *et al.* (1988) note that it is most abundant on moist, mildly acidic, moderately infertile soils. Although it is sometimes considered to be an ancient woodland indicator it does not tolerate deep shade.

Recorded in Sussex in 90% of the tetrads (Hall 1980). Common in Britain but decreasing (Rich & Woodruff 1996), and widespread in Europe except in the north and south. Also in North Africa and the Near East.

***Stellaria graminea*. Lesser stitchwort.**



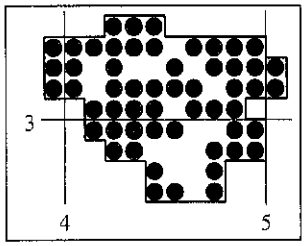
Common on the Forest (Hall 1980).

Recorded from every square. It is mainly on road verges in the centre of the Forest but elsewhere the most characteristic habitat is in damp, unimproved pastures where it is frequent.

This species has flowers of two sizes which may confuse the uninitiated. The larger flowers are hermaphrodite, and the smaller ones are wholly or partly male-sterile. In the wet summer of 1993, a smut fungus infecting the stamens was frequent.

Widespread in Britain, Europe and Asia.

Stellaria uliginosa (S. alsine). **Bog stitchwort.**

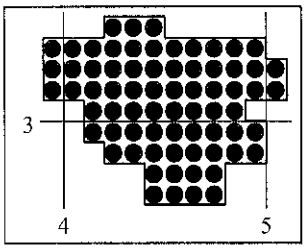


Common on Ashdown Forest (Hall 1980).

On the Forest it occurs mainly on rides and tracks in damp, open places. Later in the season when other vegetation has grown up it needs to be searched for under other plants.

In Sussex it is very much a plant of wet, acidic soils. It is widespread in Britain, Europe, temperate Asia and North America.

Cerastium fontanum. **Common mouse-ear.**

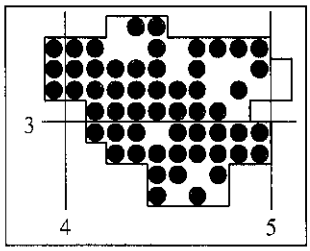


Recorded in every square, where it can be found on grassland, verges, tracks, car parks and disturbed areas.

Recorded in 98% of the tetrads in Sussex (Hall 1980), widespread in Britain and cosmopolitan.

It is a very variable species found throughout Europe. Three subspecies are now thought to occur in Britain; the four Ashdown Forest populations investigated have been subsp. *vulgare* which has leaves hairy on both sides and the stem hairy all round, but subsp. *holosteoides* could also occur.

****Cerastium glomeratum.*** **Sticky mouse-ear.**

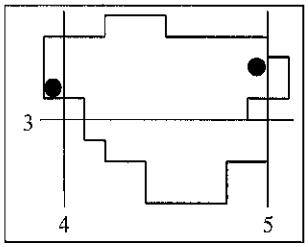


Common on the Forest (Hall 1980).

Quite frequent in disturbed places such as gateways, road drains, car parks and cultivated ground, often on nutrient-rich soils. It is absent from shady and wet places.

This species has increased markedly in Britain between the 1950s and the late 1980s, which may be due to herbicide-tolerant plants occurring in fertilised rye grass pastures (Rich & Woodruff 1990, 1996). It is widespread in Britain, Europe and temperate Asia.

Myosoton aquaticum. **Water chickweed.**



Tetrads 42P, 43V and 53B (Hall 1980).

Marshy vegetation on lake side, Twyford (394.312), 1994, DB; one plant on bank above stream, Marden's Hill (49.32), 1987, PW & RW, and probably scattered along this stream but un-recorded as our locality is between two of Hall's tetrads.

In Sussex it is usually a plant of damp, nutrient-rich places along the rivers and streams, often in shade and sometimes on stonework. It is widespread in lowland Britain and Europe.

Moenchia erecta. **Upright chickweed, Starry chickweed.**

On Ashdown Forest (Coleman 1836). Ashdown Forest, 1892, E. H. Farr (**BTN**). In dry places the rather rare little starry chickweed ... is likely to be found (Pickard 1930).

Probably extinct. *Moenchia erecta* normally occurs in very short grass on shallow soils and there is still plenty of apparently suitable habitat on the Forest. However, because it is inconspicuous and flowers very early in the year, often before the end of April, it could be overlooked.

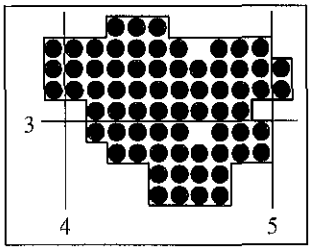
It is very rare in the county with only three sites in East Sussex and one in West Sussex. It was formerly widespread in southern Britain but is becoming rare inland except in central Wales and the New Forest. It appears to be declining, like so many of its associates, due to the lack of open ground created by grazing (Chatters 1994). Also found in central and southern Europe.

Sagina subulata. **Heath pearlwort.**

In a warren on Ashdown Forest, on the east of the Stone Quarry above Kidbrook (Coleman 1836). Forest Row, W. Borrer (Hemsley 1875). Near Duddleswell, 1895, J. H. A. Jenner (Wolley-Dod 1937). Probably extinct on the Forest, and last recorded in Sussex in *c.* 1931 (Hall 1980).

This is an unusual species which likes stony or gravelly soils in open, disturbed places which are often at least damp in winter. Borrer's site is may be the same as Coleman's which is now beech woodland, and few likely places are left for it at Duddleswell. It is close to extinction on the inland heaths of southern England and has gone from Norfolk, but still occurs frequently in the New Forest and around the rocky coasts in the west and in uplands in Scotland. It has an odd patchy distribution in western Europe.

Sagina procumbens. **Procumbent pearlwort, Bird's-eye.**

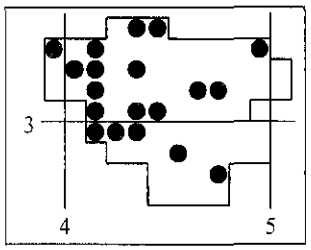


Common on the Forest (Hall 1980).

Recorded in all but two squares on the Forest, where it is typical of short, damp, open grassland, lawns, car parks, and disturbed ground.

Common and widespread in Sussex, Britain, Europe, Asia, North America and Greenland.

Sagina apetala. **Annual pearlwort.**



Common on the Forest (Hall 1980).

We have it mainly on the west side of the Forest where it occurs on disturbed soils in car parks, where it may have been introduced with gravel, on tracks, and around the villages. We have recorded both subsp. *apetala* and subsp. *erecta* and agree with Hall (1980) that the latter is commoner, but have not looked at their distributions in detail.

Widespread in Britain but mainly south-western in Europe, and also in western Asia.

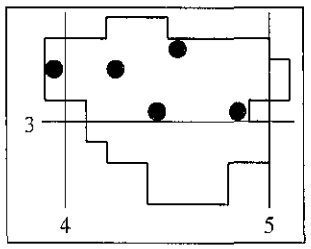
Scleranthus annuus. **Annual knawel.**

Forest Row, Miss P. Stockdale, 1910 (**BEX**; Wolley-Dod 1937).

Not refound on the Forest, and probably declining in Sussex. It is most persistent on dry, open, light, sandy soils and may not have liked our damp, silty soils.

Scattered patchily through most of Britain on suitable acidic soils but decreasing (Rich & Woodruff 1996), though widespread in Europe, Asia and North Africa.

Spergula arvensis. **Corn spurrey.**



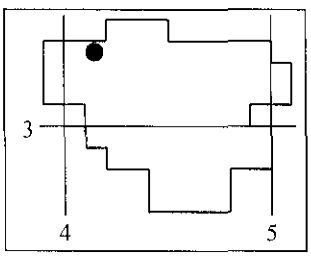
Nine tetrads in Hall (1980).

We only have five records from open disturbed ground, and it does seem rare.

It is a phenotypically and genetically variable species. In Britain the two main varieties show an interesting difference in distribution, which New & Herriott (1981) ascribe to different germination characteristics; plants examined from two sites on the Forest were var. *arvensis* which lacks papillae and is the commoner one in south-east England, whilst var. *sativa* which has papillae occurs more frequently in the north and west.

Locally frequent on sandy soils in lowland Britain but decreasing (Rich & Woodruff 1996) and widespread in Europe except around the Mediterranean. It is cosmopolitan in distribution and reportedly one of the world's worst weeds, especially in cereal crops.

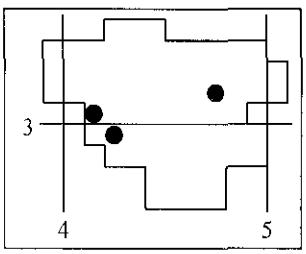
****Spergularia marina.*** **Lesser sea-spurrey.**



One plant of this seaside plant was found on bare soil on the A22 verge at Kidbrooke Hill (418.335), 1995, TR & PA.

As a native it occurs on salt marshes and saline places around the coast of Britain and Europe and the temperate northern hemisphere. It also occurs scattered inland in England on road verges, presumably spreading with the use of de-icing salt. What is surprising is that neither Danish scurvy-grass (*Cochlearia danica*) nor saltmarsh grass (*Puccinellia distans*) have been found on the Forest verges although we have looked for them; they are classic roadside salt plants which are now widespread on verges.

Spergularia rubra. **Sand-spurrey.**



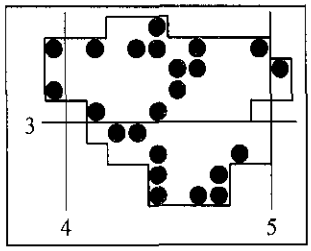
Ashdown Forest, 1895, T. Hilton (**BTN**).

We only have three records; on cinders in car park, Isle of Thorns (418.303), 1995, Flora meeting; track in Streeter's Rough (42.29), 1993, TR; Black Hill area (47.31), 1994, SBRS.

This is yet another annual which is more frequent on light, freely-drained sands, and it may not grow well on the siltier soils of Ashdown Forest.

It is scattered through Britain and decreasing (Rich & Woodruff 1996). It occurs in Europe, Asia, North Africa and North America.

Lychnis flos-cuculi. **Ragged Robin, Ragged Jack, Bachelor's buttons.**

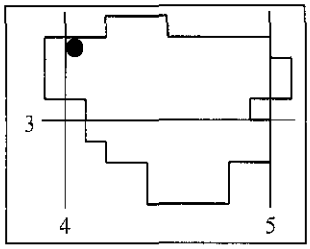


Common on the Forest (Hall 1980).

Usually found in damp or wet places in meadows, heathy grassland, on clayey rides and in open patches in woodland. In deep shade it flowers sparsely or not at all, and the hairless, narrow leaves are often a puzzle when found vegetatively.

Widespread in Britain and Europe, but decreasing in England (Rich & Woodruff 1996).

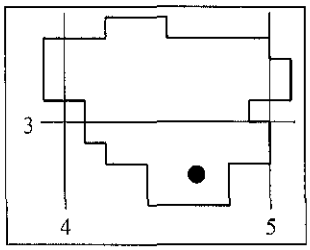
****Lychnis chalcedonica.*** **Maltese-cross.**



One clump with four fruiting stems just outside Lavender Platt (402.332), 1995, PW.

This species is widely grown in gardens and occurs as a persistent escape elsewhere in Britain. It is native in eastern Europe.

Silene vulgaris. **Bladder campion, Snappers.**

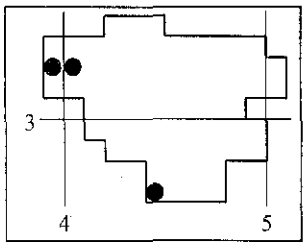


Tetrad 43F (Hall 1980).

Entrance to Spring Garden (46.27), 1995, B. Hoath & A. Main, and apparently present for a long time before that.

In Sussex widespread on the chalk and sometimes introduced with soils elsewhere, possibly the origin of Hall's record. Widespread in Britain and Europe, but decreasing in England (Rich & Woodruff 1996). Also found in temperate Asia and North Africa.

Silene latifolia (S. alba). **White campion.**

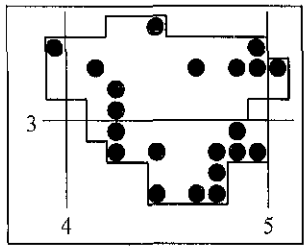


Tetrad 42N (Hall 1980).

We have three records, confirming its scarcity: Coldharbour Manor, bank by road and probably introduced (399.326), 1995, TR; introduced with soil and mown, Goat car park (401.326), 1987-1995, PW; lane south of Nutley (44.26), 1993, MM. It is usually an annual of disturbed, open places such as arable field margins, but the plant at Goat car park seems to be perennial perhaps due to mowing.

Very common on the chalk in Sussex and occasional elsewhere (Hall 1980), but not really a plant of the Forest. Widespread in Britain, Europe, western Asia and North Africa.

Silene dioica. **Red campion, Bachelor's buttons.**



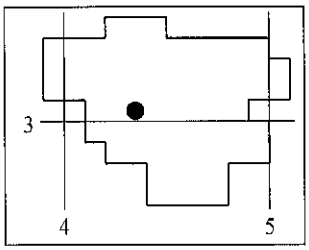
Common on the Forest (Hall 1980).

Found mainly around the edge of the Forest, usually in nitrogen-rich, shaded places such as river alluvium, old woodland edges and hedges. Usually the populations are small, but it is abundant on verge east of Fairwarp (473.266).

It is relatively susceptible to frost damage, drought and waterlogging, and tends to occur in sheltered, open woodland (Baker 1947). Widespread in Britain and western Europe as well as central Asia, North Africa and Greenland.

We have not recorded any of the *S. dioica* × *latifolia* hybrid with pink flowers which is usually quite widespread where the parents meet, probably because *S. latifolia* is so uncommon on the Forest. The two parent species are almost completely inter-fertile, and whilst *S. latifolia* is usually pollinated by moths at night and *S. dioica* by bees during the day, there are enough other pollinators around to ensure regular gene flow between them; it seems that the species are maintained by the ecological differences, the hybrids being neither properly suited to woods or fields (D. Goulson).

***Saponaria officinalis*. Soapwort, Gill-run-by-the-street.**



By Chelwood Vachery (*c.* 433.302), 1994+, Flora meeting. During the 1995 drought, the patch remained green all summer.

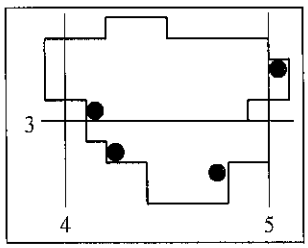
This species was apparently once commonly cultivated near wool mills and the soapy extracts from its leaves and roots used for washing wool (hence the name). When the leaves are rubbed between hands they produce a soapy, green slime which needs washing off at home. The slime is formed by chemicals called saponins which are found in many plants and whose natural function may be to provide resistance to fungal attack (Osbourn 1996).

Scattered in Sussex where it is a persistent garden escape on roadsides, etc. Widespread in lowland Britain, native in Europe but not in the north, and Asia.

POLYGONACEAE

The definitive identification guide is the BSBI docks and knotweeds handbook (Lousley & Kent 1981), but the nomenclature and sequence have been updated here.

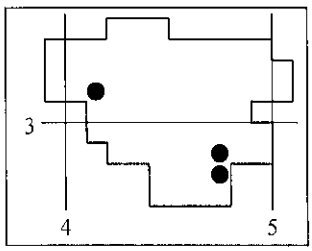
***Persicaria campanulata (Polygonum campanulatum).* Lesser knotweed.**



Planted and spreading in Maskett's Wood (428.285), 1995, TR; established garden escape outside house at Isle of Thorns (417.307), 1995, TR & PA; bank by garden at Nutley (445.276), 1995, AK; St John's area (50.32), 1994, Flora meeting.

A native species of the Himalaya, originally introduced in about 1910 and now naturalized in Scotland and Ireland in damp shaded places. Semi-naturalized in England and Wales and increasing (Rich & Woodruff 1996). It has dimorphic flowers which may account for lack of seed-set, and it spreads mainly vegetatively (Conolly 1977).

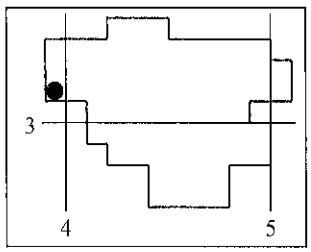
***Persicaria wallichii (Polygonum polystachyum).* Himalayan knotweed.**



A275 near Wych Cross (41.31), 1988, PW and 1993, Flora meeting; naturalized by stream on drive to Oldlands Hall (478.277), 1995, TR+; naturalized outside garden, Campfields Rough (470.280), 1995, ER & RN. Also reported in 1993 but not localised, from the A26 in the Poundgate - Heron's Ghyll area.

The history and spread of this species in Britain has been documented by Conolly (1977). As the name implies it is native in the Himalaya, and well-naturalized in western Britain. It usually spreads vegetatively from plantings or garden throw-outs; at some sites it covers acres of ground and seems to do best where sheltered from frost. Rarely naturalized in Sussex (Hall 1980), but certainly spreading in Britain (Rich & Woodruff 1996).

***Persicaria bistorta (Polygonum bistorta).* Common bistort.**

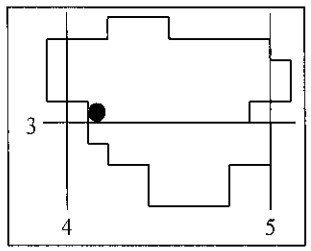


Tetrads 42E, 42N and 43L (Hall 1980).

Recorded on a hedgebank, Horncastle (393.311), 1993+, DB.

Probably introduced in south-east England and usually found near houses on the sides of ditches, streams and in damp grassy places. In northern Britain it is often found in damp meadows where it could be native. Widespread in Middle Europe, especially in damper and upland areas, Asia and Japan.

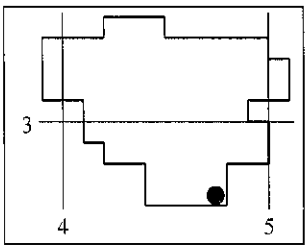
***Persicaria amplexicaulis*. Red bistort.**



Established garden escape outside house at Isle of Thorns (417.307), 1995, TR & PA.

This Himalayan species is widely grown in gardens. It is rarely naturalized in south-east England but more widely so in the west of Britain and Ireland. It does not appear to set seed in Britain.

Persicaria amphibia (Polygonum amphibium). **Amphibious bistort.**

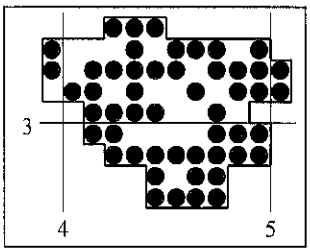


Tetrads 43A and 43H (Hall 1980).

Surprisingly rare given the number of ponds with base-poor, medium-nutrient water, and only recorded in 47.26, 1994, Flora meeting (details not recollected and possibly an error).

One of the few truly amphibious plants in Britain, occurring in permanent water and on dry land though often not flowering in the latter case. Common in Britain and increasing (Rich & Woodruff 1996), and widespread in Europe, Asia, Africa and North America.

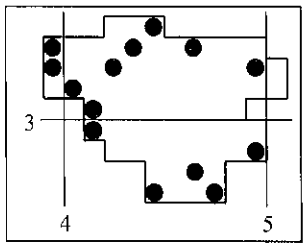
Persicaria maculosa (Polygonum persicaria). **Redshank, Lover's pride.**



Frequent on roadsides especially in the gutters, on pond edges, in the villages, car parks and arable fields, etc., often on reasonably nutrient-rich soils. It is only occasionally found in woodland rides and does not appear as shade-tolerant as *P. hydropiper*. Whilst most plants examined have lacked glands, a few with glands scattered on the pedicels were treated as this species and not the next.

Recorded in 90% of the tetrads in Sussex (Hall 1980). Common throughout lowland Britain and Europe, and widespread elsewhere in the world as a weed.

Persicaria lapathifolia (Polygonum lapathifolium). **Pale persicaria.**

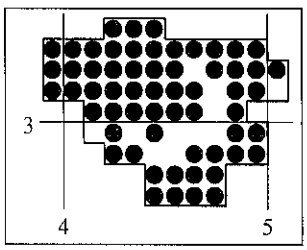


Common on the Forest (Hall 1980).

Possibly under-recorded on the Forest. This and *P. maculosa* frequently grow together but the differences are not always immediately obvious; *P. lapathifolia* is certainly less common. It is found on the edges of roads, in gardens and in arable fields. It was abundant at the organic farm at Plawhatch in 1995.

Common in Sussex and lowland Britain, and possibly increasing in England (Rich & Woodruff 1996). Probably more widespread in Europe than *P. maculosa*. Found in temperate regions of the northern hemisphere and in South Africa.

Persicaria hydropiper (Polygonum hydropiper). **Water-pepper.**



Common on the Forest (Hall 1980).

Most typical of wet patches on shaded rides and often abundant on them. It is especially frequent in damp muddy hollows where the soils are silty and compacted, and it is largely absent from the heathy, acidic soils. It has a persistent seed bank and 4% of the seeds may still be viable after 50 years (Salisbury 1970).

Young plants can be distinguished from *P. maculosa,* with which it may grow, by the peppery taste as the English name hints.

Common in Sussex, Britain, lowland Europe, temperate Asia snd North Africa.

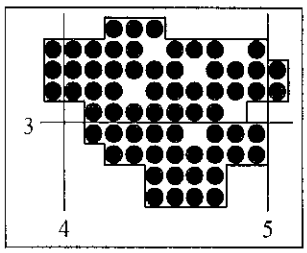
Persicaria minor (Polygonum minus). **Small water-pepper.**

Near Rifle Butts, Forest Row, Miss P. Stockdale (**BEX**; Wolley-Dod 1937); this site was probably at about 425.337 and was drained for the golf course.

Probably extinct. This is a species of wet grassland, swamps and pond edges, often on nutrient-rich mud which dries out in summer (Mountford 1994). Plants produce both flat and trigonous seeds in varying proportions which differ in some germination characteristics, though both germinate best in the spring and in the light (Salisbury 1970).

Scattered thinly over the southern part of Britain and always scarce in Sussex, particularly so in the east. Quite widespread in Europe except the extreme north and south and temperate Asia.

Polygonum aviculare sensu stricto. **Knotgrass, Armstrong.**

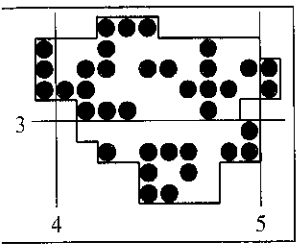


Quite frequent in car parks, on road edges, field edges and villages, but very uncommon anywhere else.

Virtually ubiquitous in lowland Europe, and temperate Asia.

P. aviculare s.s. and *P. arenastrum* have often been recorded as an aggregate in the past, but they are readily distinguished. *P. aviculare* is a sprawling plant with a variety of leaf sizes, and the fruit has three equal sides. *P. arenastrum* is a more compact plant with mainly equal, small leaves except at the tips of branches, and the fruits have two equal sides and a smaller, concave one.

Polygonum arenastrum. **Equal-leaved knotgrass.**

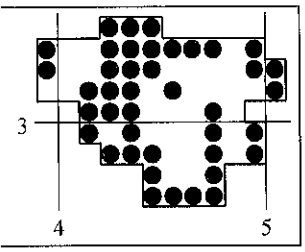


Tetrad 43H (Hall 1980).

Usually a plant of trampled areas, especially car parks and gateways. Probably a little under-recorded, and certainly so in Sussex (Hall 1980).

It is widespread in Britain but under-recorded, Asia and temperate Asia.

****Fallopia japonica (Reynoutria japonica).*** **Japanese knotweed.**



Common on the Forest (Hall 1980).

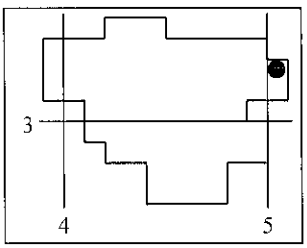
We have widely recorded it from roadsides, waste ground and stream sides, and it seems to be spreading. It produces little seed (none in two populations examined on the Forest) and spreads very effectively by roots and rhizomes, thus often introduced with soil on roadsides, or washed down rivers. Some patches now cover several hundred square metres.

It is a vigorous species native in the lava fields in Japan and the Far East. Conolly (1977) has described its spread in Britain. It was first introduced as an ornamental garden plant in 1825. It may be a little restricted by climate; it is affected by frost and possibly drought, but unfortunately usually recovers rapidly.

This and *Heracleum mantegazzianum* are the two vascular plants that it is illegal to introduce into the wild yet it is still increasing (Rich & Woodruff 1996). It can grow through tarmac, paving and stonework, and is a considerable nuisance on river banks. Its shoots can grow 4 cm a day in the spring, and it rapidly swamps other vegetation. Once established it is difficult to eradicate, and in areas with sensitive wildlife requires three good doses of glyphosate or 2,4-D. with follow-up spot treatment. It can also be controlled by regular cutting, or intensive grazing by sheep or goats.

On the Forest war has been declared on Japanese knotweed and a control programme implemented. It is controlled in about 16 sites by a combination of cutting and spraying. Small areas of young plants can be pulled out by hand, which is labour intensive but works well, as at the entrance to the Ashdown Forest Centre car park. On larger patches if new growth is caught early in the year, spraying with glyphosate and a wetting agent can be effective. Larger, taller patches are first cut, and then sprayed when the regrowth is about 0.5 metres high, which is not only easier to do but the younger foliage absorbs the spray better. Absolute control can be achieved but requires effort over several years.

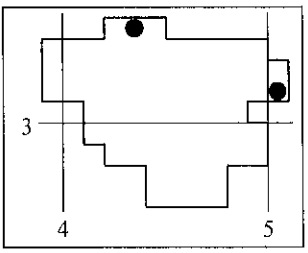
****Fallopia* × *bohemica (F. japonica* × *sachalinensis).*** **Bohemian knotweed.**



Verge bank below a garden on the B2188 (509.322), 1993, PW.

This hybrid is becoming more widely recognised and recorded in Britain. It has often been mistaken as *F. japonica*; useful leaf outlines showing the consistently cordate leaf bases are given in Rich & Rich (1988).

****Fallopia sachalinensis (Reynoutria sachalinensis).*** **Giant knotweed.**

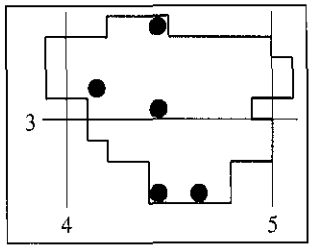


Recorded in tetrad 33W (Hall 1980) but possibly outside our area.

One large clump near the entrance to Posthorn Lane, Forest Row (435.347), 1993, TR; car park at St John's (504.315), 1991, PW, and hopefully eradicated by spray in 1994/5.

Rarely established in Sussex where it has been thrown out of gardens or crept under the fences of its own accord, and most often naturalized now in wet places on stream banks. Probably first introduced from the Far East, as a fodder plant; it is now scattered throughout lowland Britain (Conolly 1977).

***Fallopia convolvulus (Polygonum convolvulus).* Black-bindweed.**

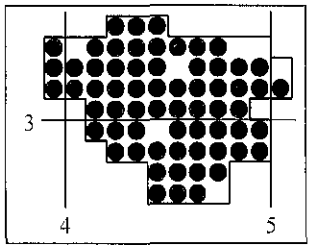


Occasional in the Forest area (Hall 1980).

We have a few scattered records from disturbed soils on verges, in gardens, or introduced with imported soil as at Pippingford (444.302), 1993, TR & PD.

Common in Sussex except on heavy soils. Widespread in Britain, Europe, temperate Asia and North Africa.

***Rumex acetosella* subsp. *acetosella*. Sheep's sorrel.**



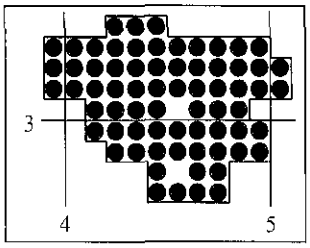
Common on the Forest (Hall 1980).

Widespread and common on open rides, dry banks, disturbed ground and sometimes on litter in heathland. The few plants checked have all had the fruiting perianth separated from the achenes and are subsp. *acetosella*; little is known about the distribution of subsp. *pyrenaicus* in which the perianth is not easily separated from the ripe achenes. On some of the sandy commons in West Sussex the leaves may be very narrow and in-rolled - these plants have been called '*R. tenuifolius*' though this is now known to be a growth form on dry soils (see Rich & Rich 1988); on the wetter Ashdown Forest soils no narrow-leaved plants have been seen.

This species is dioecious, with male plants flowering earlier than female ones. The male plants also put more resources into vegetative growth than female plants, and may be able to persist better in closed vegetation (Grime *et al.* 1988). It has a good seed bank allowing it to recolonise after drought (Hintikka 1990), and young plants were very abundant after the 1995 drought in many places on open soils, such as around Gills Lap (468.319).

Common on acidic soils in Sussex, Britain and much of the world.

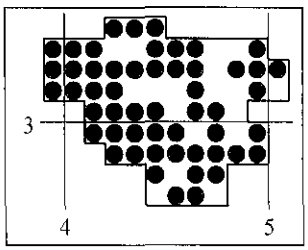
***Rumex acetosa* subsp. *acetosa*. Common sorrel, Sorrow.**



Common in damp grassland, on rides and on verges.

Recorded in 93% of the tetrads in Sussex (Hall 1980). Widespread and common in Sussex, Britain, Europe, temperate Asia, Japan, North America and Greenland.

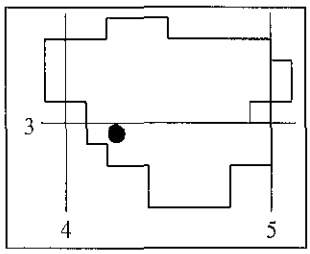
***Rumex crispus* subsp. *crispus*. Curled dock.**



It is interesting to find that this species, one of the commonest angiosperms and most widespread plants around the world, is not common on Ashdown Forest although it has been recorded from over half of the squares. It is mainly a nitrophile, so where it does occur on the Forest it is found in disturbed places, grassland and villages.

Recorded in 95% of the tetrads in Sussex (Hall 1980). Common and increasing in Britain (Rich & Woodruff 1996), and common in Europe and most of Africa.

Rumex* × *pratensis (R. crispus* × *obtusifolius; R. acutus).

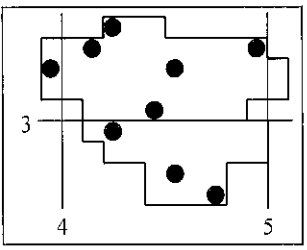


Heron's Ghyll, near Fairwarp, A. H. Wolley-Dod (Wolley-Dod 1937).

Recorded in the private meadow at Braberry Hatch (428.296), 1994, TR & DK with both parents, but possibly present elsewhere and overlooked.

It is supposed to be frequent in Britain.

Rumex conglomeratus. **Clustered dock.**

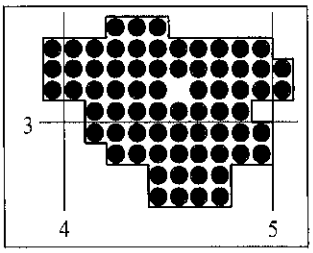


Recorded in eight tetrads in Hall (1980).

This dock is surprisingly rare on the Forest, and may historically have been be over-recorded for *R. sanguineus*. It is mainly found in unimproved grassland.

It is thought to be increasing in England (Rich & Woodruff 1996). Widespread in Europe south of the Baltic, temperate Asia and North Africa.

Rumex sanguineus var. *viridis.* **Wood dock.**

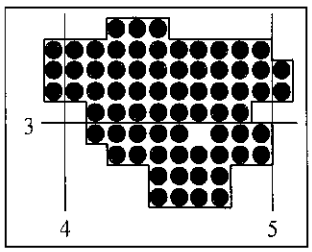


Common on the Forest (Hall 1980).

Probably the commonest, most widespread dock on the Forest, along the edges of woodland, hedges, urban areas and car parks.

Increasing and widespread in Britain (Rich & Woodruff 1996), and mainly western in Europe, also south-west Asia and North Africa.

Rumex obtusifolius. **Broad-leaved dock.**

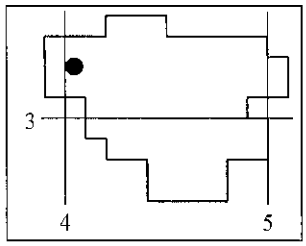


Only unrecorded in one square on the Forest which is largely acidic heathland. It is generally similar in ecology to *R. crispus*.

Recorded in 98% of the tetrads in Sussex (Hall 1980). Increasing in England (Rich & Woodruff 1996), widespread and common in Britain, Europe, temperate Asia, North Africa and Japan.

CLUSIACEAE

Hypericum calycinum.* **Rose-of-Sharon.



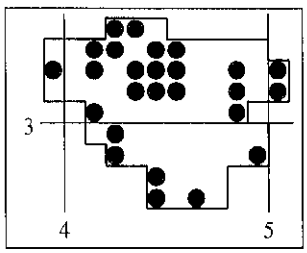
Tetrad 43Q (Hall 1980), not refound.

Woodland north of Twyford car park (408.321), 1984-1994, DB.

It has been widely grown in gardens in Britain since it was introduced in 1676, possibly from a single clone. It mainly propagates vegetatively and is probably established from dumped garden rubbish rather than from seed. In Britain about one fiftieth of the natural seed is set as it is self-incompatible, though more seed is set in hot summers (Salisbury 1963, 1969a).

Native in northern Turkey and south-east Bulgaria where it often occurs on shady riverbanks and in the understory of oak and beech woods..

Hypericum androsaemum. **Tutsan, Sweet amber, Titsum.**

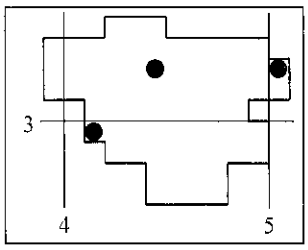


Ashdown Forest (Whitwell 1902). In a wood leading from Forest Row to Wych Cross (Peters 1935). Common on the Forest (Hall 1980).

We have usually found one or two plants at each site, mainly in woodlands, with a concentration of records on the north-facing slopes in the Hindleap and Broadstone areas. Seed taken from a plant at St John's in 1991 is now a virulent weed in PW's garden in Surrey, and it reproduces freely. It is often cultivated, and there may be a regular exchange of seed between gardens and wild areas.

In Britain it is common in suitable areas in the south and west and is especially frequent in the Weald and New Forest, with fewer records elsewhere which are often of garden escapes. It is a strongly western plant in Europe reaching its most northerly limit in Scotland, and also occurring in south-west Asia to northern Iran and north-west Africa.

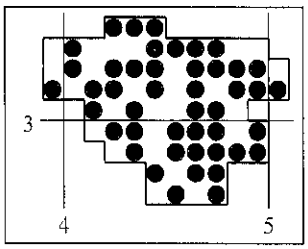
***Hypericum* × *inodorum* group. Tall tutsan.**



One large clump by footpath west of road, Chelwood Gate (412.299), 1994, TR; dumped garden rubbish near Stone Cottage (447.327), 1995, TR & PA; three places down stream in Keyward's Wood (c. 502.325), 1995, TR. Hall (1980) gives two records in Sussex.

The variation is due mainly to the *H. hircinum* parent. They are occasionally naturalized as garden escapes throughout the country.

***Hypericum perforatum*. Perforate St John's-wort.**

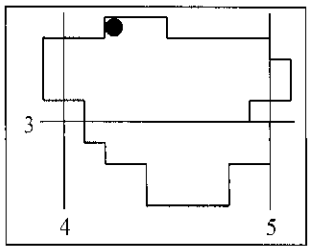


Very common on the Forest (Hall 1980).

Widespread around the Forest on verges, on clays and in the more base-rich places but quite absent from acidic heath. It has a wide ecological amplitude, and occurs on a range of soil types in grassland, verges and waste ground, and in some very dry sites. Grime *et al.* (1988) note that its grassland distribution is biased towards burnt sites. Shoots grown in strong sunlight are poisonous to stock

Widespread in lowland Britain north to southern Scotland. Europe, temperate Asia and North Africa. A noxious weed in Australasia, South Africa, California, Iraq, etc.

***Hypericum* × *desetangsii* (*H. maculatum* × *perforatum*).**

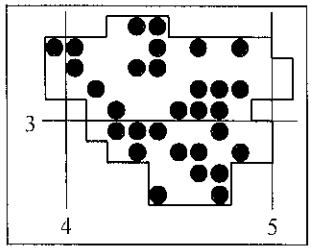


Ashdown Forest, 1983, BSBI Meeting (confirmed by N. K. B. Robson), seen again in 1984, DB, but not present in 1990.

We have only one recent record; Forest Row (423.341), 1995, DB & PD, but it is also known from the old railway line outside our survey area. Plants with two strong and two weak ridges on the stems, and acute or apiculate sepals should be checked for this hybrid. Crackles (1990) notes that it is a very variable hybrid which may be widespread on railways.

It is apparently rare in Sussex (Hall 1980), and is scattered through Britain. It is also recorded in Europe.

***Hypericum maculatum* subsp. *obtusiusculum*. Imperforate St John's-wort.**



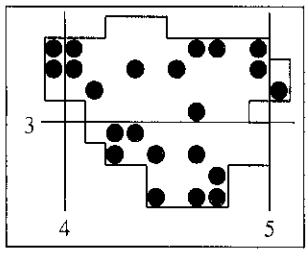
and

Forest Row, Miss K. Pickard (Wolley-Dod 1937). Frequent on Ashdown Forest (Hall 1980).

We have recorded it scattered around the Forest on verges, banks, etc., preferring more acidic soils than *H. perforatum*. This species or its hybrid with *H. perforatum* is quite frequent along the old railway line at Forest Row. Inflorescences from there are collected to make aromotherapy oil which is apparently good for treating aches and pains - the flowers turn the oil a brilliant red.

Frequent on the sands and clays in the north of East Sussex but rarer elsewhere. The distribution of this plant in Britain is oddly clustered in the Weald, central Wales and the west Midlands, in northern England, and also in southern Ireland. It is widespread in lowland montane Europe, with subsp. *maculatum* in Europe and as far east as western Siberia.

***Hypericum tetrapterum*. Square-stalked St John's-wort.**

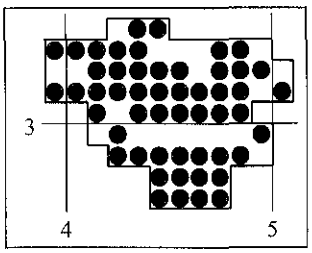


Frequent on the Forest (Hall 1980).

Widely scattered on the Forest, normally occurring only as a few plants. It is usually found in the wetter grasslands or around ponds on clayey soils, and sometimes also on woodland rides where it reappears after disturbance but slowly decreases in frequency as the rides grow over again.

Widespread in lowland Britain, and in Europe east to the Caucasus and in North Africa.

Hypericum humifusum. **Trailing St John's-wort.**

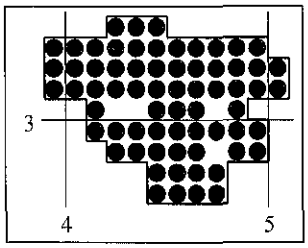


Frequent on the Forest (Hall 1980).

Frequent and most characteristic of rides, especially in woodlands, where it may be very abundant after disturbance from clearance or coppicing. It was more frequent in the dry summer of 1995. Plants will flower in their first year, and the flowers open mid-morning and close mid-afternoon.

Widespread in Britain but decreasing in England (Rich & Woodruff 1996). Widespread in Europe south of the Baltic, and it occurs in North Africa.

Hypericum pulchrum. **Slender St John's-wort.**

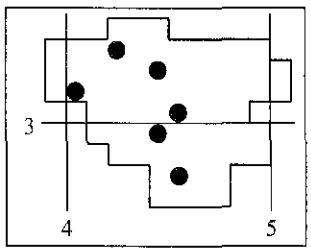


On the Forest (Firmin 1890). Common on the Forest (Hall 1980).

We have found it in most of the squares. It is a calcifuge which often occurs in dry places on banks and hedgebanks, in woodland, on the dry banks of streams and in open heathy places. The flowers often change from yellow to orange-red as they get older, and can be quite striking in colour.

Common in the Weald (Hall 1980) and widespread in lowland Britain but absent from much of the Midlands. Endemic to north-west Europe.

Hypericum elodes. **Marsh St John's-wort.**



Bogs on Ashdown Forest (Coleman 1836). In a bog near Gills Lap, 1911 (Done 1914). Ashdown Forest, many observers (Wolley-Dod 1937). Chelwood Gate (42.30), 1955, R. Mackechnie & E. C. Wallace (BRC). Near Nutley, 1957, R. A. Boniface (BRC). Frequent on the Forest (Hall 1980).

Abundant round a lake at Smockfarthing (401.315), 1995, DB; one clump on dry stream bank on golf course where it survives strimming (429.338), 1992+, NM; flush in grazing experiment, expanding after grazing reintroduced (445.297), 1992+, NM; north-east of pond, Ridge Road (446.328), and also one large clump in pond on south side of heavily shaded pond (447.328), 1995, PW; Lower Misbourne near where path crosses stream (456.277), 1994, RN & ER; several plants round edge of newly made pond in heath, Pippingford Park (454.305), 1993, SBRS. Also recorded in a wet ditch west of Millbrook west car park (437.297), c. 1980, PD, but gone in 1994.

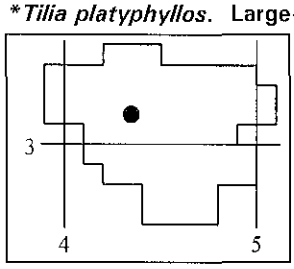
In Sussex, this is much reduced in frequency since Wolley-Dod's (1937) flora. It is now mainly recorded on Ashdown and St Leonard's Forests, and is very rare elsewhere. It is a typical heathland plant of boggy, wet places, and may once have been more widespread on the Forest. It is tolerant of grazing and smells musty which may deter animals, and in the New Forest forms large sheets in boggy ground and ditches in heavily grazed areas. It is also surprisingly shade-tolerant and can survive under trees as at the Ridge Road ponds. In Britain and Europe it is strongly western in distribution possibly because of sensitivity to frost; aerial parts of plants in cultivation at Forest Row were badly hit in November 1995, though those under water survived well.

The flowers open for one day only, opening mid-morning and closing at *c.* 5 p.m. The flower structure suggests that it should be self-incompatible as the structure is designed for out-breeding (N. K. B. Robson, pers. comm. 1995). To investigate this, five flowers on one cultivated plant were selfed and good seed was set in all, ripening about 6 weeks later. Also one isolated plant on the golf course at Forest Row was observed to be setting good seed in 1995. It is clearly self-compatible.

It is endemic to western Europe, northwards to north-west Scotland and eastwards to Germany, Italy and extinct in Austria.

TILIACEAE

Tilia platyphyllos.* **Large-leaved lime.

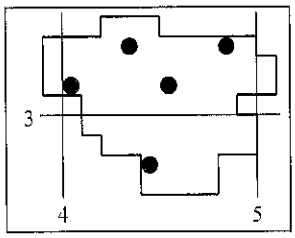


Kidbrook by the Park pales (Jenner 1845); this record could refer to *T.* × *vulgaris*.

Six trees of various sizes with a few seedlings with their characteristic five-fingered cotyledons on the edge of a ghyll in Southbank Wood (431.314), 1995, TR, probably planted as part of Ashdown Park. This area of woodland is amongst the best in Southbank Wood which is otherwise exceptionally dull, and the limes were growing over bracken with bluebells and wood anemones. No limes are currently known at Kidbrooke.

In Sussex this has now been recognised as native in the woodlands along the foot of the north-facing scarp of the South Downs where it was probably one of the canopy dominants in the original woodlands. It is one of the rarest native trees in Britain, but has also been widely planted. Its ecology and conservation are discussed by Pigott (1981). It occurs in central and southern Europe north to Britain and south-west Sweden. It also occurs in eastern Europe, Asia Minor and the Caucasus.

Tilia* × *vulgaris*. **Lime.



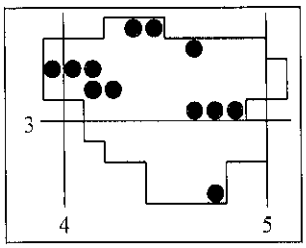
Five tetrads on the south side of the Forest, hardly naturalized (Hall 1980).

Our trees are probably all planted near habitation, but only two match Hall's tetrad records indicating it has been variably recorded by both his and our recorders. One sapling was found in Forest Row (43.33), 1993, TR. We agree that it is not really naturalized.

The hybrid has been widely planted in Britain and Europe since the middle ages (Pigott 1991).

MALVACEAE

***Malva moschata*. Musk-mallow.**

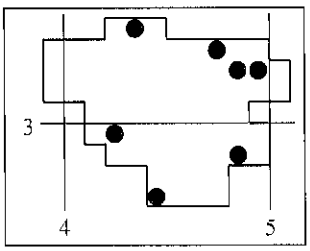


Five tetrads in Hall (1980).

Scattered around the Forest on grassy verges, car parks (e.g. abundant at Churlwood, 417.311), hedgebanks and pastures. It avoids the more acidic soils, and is still frequent in unimproved grassy places in England, though decreasing (Rich & Woodruff 1996). Widespread but mainly western in Europe, and found in North Africa.

It is a very pretty plant, and is sometimes grown in gardens. Hanbury (1917) grew a locally-collected white-flowered form in his garden at Brockhurst, but we have not seen white musk-mallows on the Forest. He also noted that seeds collected from it gave some white- and some pink-flowered plants.

***Malva sylvestris*. Common mallow, Cheese plant.**

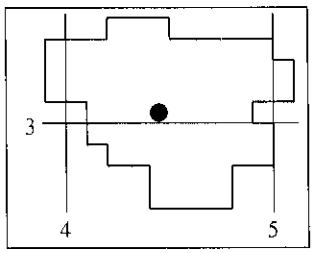


Four tetrads on the south side of the Forest (Hall 1980).

We have recorded it as scattered mainly around the edges of the Forest. If you have time on a sunny day it is worth watching this species, as the leaves track the sun. The signal is detected in the pulvinus where the leaf joins the stalk, and movement seems to be initiated by the blue component of sunlight only.

Hall (1980) notes it is almost absent from the High Weald and the Wadhurst clay which is interesting for a plant otherwise widespread in lowland Britain. It is widespread in Europe south of the Baltic.

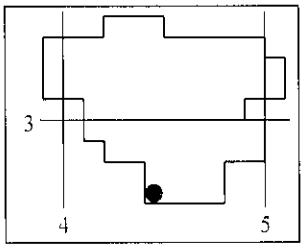
****Malva neglecta*. Dwarf mallow.**



Recorded once on introduced soil in Pippingford Park (444.302), 1993, SBRS.

It is quite an uncommon plant in Sussex, and grows mainly on light soils. In Britain it occurs mainly in the south-east, and is widespread in Europe except the north. Also found in Asia and North Africa.

****Alcea rosea*. Hollyhock.**

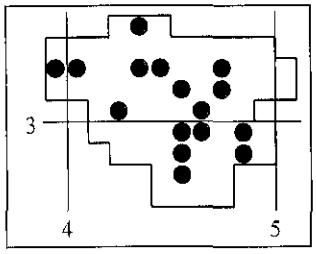


Recorded as a garden escape south of Nutley (44.26), 1994, TR, but scarcely naturalized.

Occasionally naturalized in Britain. Its origin is obscure, but it may be from China.

DROSERACEAE

***Drosera rotundifolia*. Round-leaved sundew.**



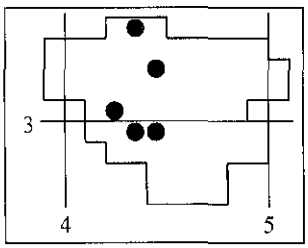
Bogs of Ashdown Forest, plentifully (Coleman 1836). On the bogs on Ashdown Forest, near Chuck Hatch and elsewhere (Done 1914). Boggy heathland, Ashdown Forest, 1970, D. P. Young (**BM**). Abundant in bogs south of Forest Row, 1948, R. A. Boniface. Eleven tetrads on the Forest (Hall 1980). Present on most ditch sides near Royal Ashdown golf course club house, colonising bare soil, 1987+, PS.

It was recorded from fifteen squares during recent survey work. In most of these it occurs in several discrete patches, on bare ground in wet areas or amongst *Sphagnum* mosses. Populations survive on some well-used paths and rides where there is a little disturbance. Some populations may well have been lost with habitat changes in recent years. Valentine (1979) noted that sundews can reproduce vegetatively by adventitious buds which develop on the leaves in late summer and autumn.

D. rotundifolia is frequent in the north and west of Britain. It is found elsewhere in Europe from Iceland and northern Scandinavia to northern Spain. It also occurs in temperate Asia, Japan, Greenland and North America. It is usually confined to areas with a high water table or high rainfall and humidity. It does not often occur in open pools, as *D. intermedia* can, but it is frequent at the edges of pools amongst bryophytes.

Sundews are carnivorous plants. Invertebrates are attracted to the shiny glands at the ends of the tentacles on the leaves. They become stuck to the sticky secretions, and then trapped as first the tentacles and then the whole leaf fold together. The plants benefit from absorbing nutrients from their prey, particularly phosphorus and nitrogen, which are likely to be deficient in their soils. They can survive without catching any prey, but under experimental conditions feeding them has shown increased biomass, number of leaves, seeds and weight of seeds (Crowder *et al.* 1990).

***Drosera intermedia (D. longifolia)*. Oblong-leaved sundew.**



Near Forest Row (Cooper 1835). Bogs of Leg's Heath, Ashdown Forest (Coleman 1836). Near Forest Row (Deakin 1871). Ashdown Forest near Nutley, M. R. Dixon, 1886 (Arnold 1887). Ashdown Forest, 1894, H. Farr (**BM**). Bog near the rifle range, Forest Row, Miss P. Stockdale (a specimen in **BEX** is labelled East Grinstead, August 1911 but surely must relate to Forest Row); Quabrook Common between Hartfield and Forest Row, 1817, E. Forster, and seen by Wolley-Dod in 1937; between Pippingford Park and Chelwood, E. Ellman; between Chelwood and Nutley, E. H. Farr; bog north of Gills Lap, E. D. Morgan (Wolley-Dod 1937). Frequent in bogs east of Broadstone Warren, 1948, and near Nutley, 1957, R. A. Boniface. Tetrads 42J, 42P, 43F and 43H (Hall 1980).

Trampled ride east of the Isle of Thorns with *Rhynchospora* (423.304), 1988, CM, and 1993+, TR *et al.* but declining as the area re-vegetated; ride in the grazing area (444.296), 1983+, CM and still present 1994, TR & PA but the site appears to be drying up in recent years; large population on small footpath leading west from the A22 on the slope below Millbrook west (438.294), 1983+, CM but the path has grown over and there was no sign of it in 1995, but another population of 100 plants was found to the south with *Rhynchospora* (438.292), 1994, PW; Broadstone Trail near the pile bridge with *Rhynchospora* (441.327), 1994, AK but only a single plant in 1995 declined for no obvious reason, NM & CM; bare soil on areas stripped of turf on practice range in 1987, and holding own in quite closed turf for several years, 100 metres south of golf course club house (431.341), still present in 1994, PS.

Drosera intermedia appears to be declining on the Forest, possibly due to changes in management and trampling, or to changes in ground water levels. There is a fine balance between the level of trampling required to maintain the necessary open patches and erosion which is too heavy. It has gone from the wet heath north of Goat car park (403.327), 1986, FR (Coleman's site) which is now more heavily used. This together with the loss of the Millbrook west site shows just how important the balance of trampling pressure is for keeping sites open for this species.

It is primarily a plant of sites which are flooded in winter and subject to drying out in summer, although it is also widespread in bog pools. The sites on the Forest which appear to have been lost recently were possibly relatively dry compared to typical habitats.

D. intermedia is scattered and local in distribution in England and Wales, where its decline is blamed on drainage. It is a more lowland plant than *D. rotundifolia* and *D. anglica* in Britain, reaching only 350 metres altitude in Scotland and 335 metres in Ireland. It also has a more restricted European distribution, being absent from northern Scandinavia and rare in eastern Europe (Crowder *et al.* 1990). It also occurs in Asia Minor and North America.

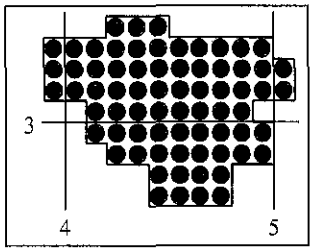
VIOLACEAE

****Viola odorata*. Sweet violet.**

Recorded in tetrad 42T in Hall (1980), probably as a garden escape, but not seen by us.

It tends to grow best on more calcareous soils and may not persist on the acidic Forest soils. In southern Europe it occurs in natural habitats such as alluvial woodlands and scrub but becomes less frequent in them in the north. It is clearly native in the Mediterranean and has been introduced as a medicinal and ornamental plant elsewhere.

***Viola riviniana*. Common dog-violet.**



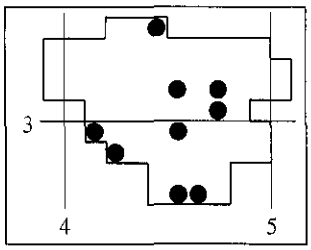
Common on the Forest (Hall 1980).

This is the commonest violet on the Forest, in hedges, woodland, road verges, banks and on tracks. It is also variable, as elsewhere in Britain. Good '*V. riviniana*' has quite yellowish spurs to the flowers and there are some very good, distinct populations on the Forest. Others have broad, purplish spurs; these are currently interpreted as hybrids with *V. reichenbachiana*, and some of the populations are mapped separately (see below). Plants with pale bluish flowers occur on road verges immediately east of King's Standing.

Cranfield transplanted 24 boxes of violets within his woods at Broadstone Farm to an area with oaks as a food plant for the silver-washed fritillary (*AFN* 14: 14-17). The flowers are also regularly eaten by slugs and insects and small holes can be seen in the spurs where they have been robbed by bees. If there are few pollinators around during the main flowering period in the spring seed set would be very low, were it not for seed production by the cleistogamous flowers which are produced all summer (Beattie 1969).

Almost ubiquitous in Sussex and Britain. Widespread in Europe except in the south-east, and in North Africa.

***Viola* × *dubia* (*V. reichenbachiana* × *riviniana*).**

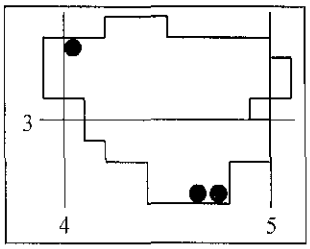


Plants with purple spurs seen on Ashdown Forest were regarded as hybrids by JK in 1995, and differ from European *V. riviniana*; most were reasonably fertile. They are widespread both on and around the Forest (e.g. woodland at Toll Lane, Boringwheel Mill, Wych Cross, Parrock Lane), and may be quite widespread in Britain. Their interpretation depends on the species concept of *V. riviniana,* which seems to be broader in Britain than on the Continent.

In Europe and Britain, the two parents tend to be partially ecologically separated, *V. riviniana* in the open and *V. reichenbachiana* in woodland though there is considerable overlap in their ecological requirements. Where their habitats are fragmented they come into contact regularly, and this may have resulted in extensive hybridisation.

The parents overlap in flowering time, *V. reichenbachiana* usually coming into flower before *V. riviniana*, and the pollinators are not specific. Flowers of both species usually last about 7-14 days. Initially the flowers are designed for pollination by a few specific insects such as bees which can operate the pollination mechanism; they are attracted to the nectar which can half fill the spur. Later, the floral organs and the way that the pollen is presented change considerably as the flowers age and the pollen can be transmitted between flowers by many generalist pollinators (Beattie 1969).

***Viola reichenbachiana*. Early dog-violet.**



This species occurs in woodland on clay soils, as at the copse near Mudbrooks House (403.339), pH 6.3, 1995, TR & PA, or the woodlands at Toll Lane (460.263- tetrad 42T in Hall 1980), pH 6.5, 1993, TR & NM where it also occurs on the verges, and at Furnace Wood (47.26), 1994, TR & SR. It was also recorded in tetrad 42P in Hall (1980) which looks odd as there are no suitable soils.

It is widespread in woodlands in lowland Britain, Europe, Caucasus, Kashmir, Morocco and Madeira.

Viola seeds are dispersed either purely by ants attracted by a caruncle which provides food, or by explosive ejection of the seeds followed by dispersal by ants (Beattie & Lyons 1975). Seeds of most species such as *V. riviniana* and *V. reichenbachiana* are dispersed explosively first by the capsules which split into three segments, and then may be carried further by ants. Only a few Eurasian species such as *Viola odorata* and *V. hirta* are dispersed purely by ants (possibly those of the genus *Formica*). The plants show various adaptations of the capsules and seeds; those with ballistic dispersal have fruits held on erect peduncles and small, shiny seeds with a small caruncle. Capsules of species dispersed purely by ants tend to be held near the ground and have large seeds with tough coats and a large caruncle as bait. Seeds of both groups germinate better when they have been gnawed by ants, but some seeds get eaten completely.

[*Viola canina*. Heath dog-violet.

Coleman (1836) recorded *Viola flavicornis* (a variety of *"Viola canina"* with deeply cordate leaves) from Ashdown Forest, but the exact identity of his plants is unknown.

We await confirmation of the presence of *V. canina* on the Forest, including the unverified records for tetrads 43L and 43W in Hall (1980). True *V. canina* occurs nearby on Holtye Common and possibly still on Chailey Common, and it might be expected from Ashdown Forest. One possible plant occurred on a track at Wych Cross Place (418.316), 1987, PW & RW, but has not been refound.

Plants need to be carefully checked, and some records may arise from non-experts assuming that "dog violets" are *V. canina* rather than the very common *V. riviniana*. Historically, both *V. canina* and *V. riviniana* were included in the same species giving further potential for confusion.]

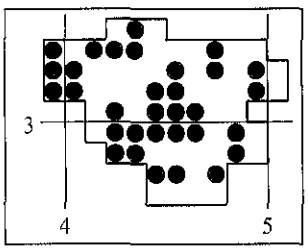
***Viola lactea*. Pale dog-violet.**

This was collected in 1951 by John Lavender from a roadside in the Crow's Nest area on his way to meet Francis Rose but has never been seen again, despite being searched for. It could have occurred on the less acidic verges with slightly better soils with plants such as *Linum catharticum* with which it occurs in the New Forest. Studies on *V. lactea* indicate it seems to require warmer, more open drier habitats than *V. riviniana*, and this may explain why it was so uncommon on Ashdown Forest where the silty soils are just too wet.

Hybridisation and over-growth is believed to have resulted in loss of populations at Chailey and Copthorne Commons in Sussex (Hall 1980). It is tempting to suggest that the pale blue *V. riviniana* plants near King's Standing are relict hybrids, but no detailed studies have been carried out.

Viola lactea is a Nationally Scarce Species and has been recorded in 71 10-km squares in Britain, evidently declining due to loss of open heathland especially in the east (Evans 1994; Rich & Woodruff 1996). It is now presumed extinct in Sussex and has not been found recently despite searches of former sites. It is an extreme Atlantic species endemic in western Europe from North Wales and Ireland to Portugal. The former East Sussex sites were the most easterly.

***Viola palustris* subsp. *palustris*. Marsh violet.**



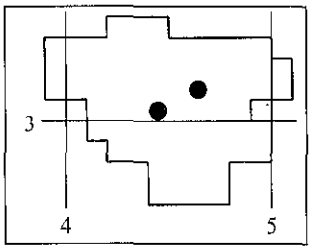
Ashdown Forest, N. J. Treutler (Wolley-Dod 1937). Common on Ashdown and St Leonard's Forests but rare elsewhere in Sussex (Hall 1980).

On the Forest it is most characteristic of wet woodlands, and at the bottom of long *Molinia* flushes often hidden between the bases of the tussocks. Nowhere is it common, and many populations have only a few plants. Flowers have only rarely been seen in March and April, but capsules from the cleistogamous flowers can be found through the summer.

All plants checked were the glabrous subsp. *palustris*. The hairy subsp. *juressi* which is more western in distribution in Britain might have been expected to occur as so many other western plants do, but has not been recorded.

Widespread in the north of Britain and Europe, the Moroccan mountains, Azores, Greenland and northern North America.

***Viola arvensis*. Field pansy.**



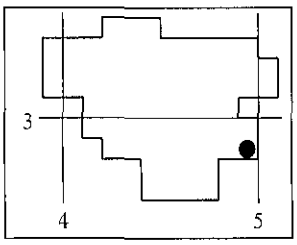
Introduced with soil in Pippingford Park (444.302), 1993, SBRS, and verge with weeds at entrance to Tile Lodge (467.315), 1993, PW.

It is locally common as an annual weed in arable fields in Sussex but it avoids acidic soils (Hall 1980). Herbicide-resistant strains have evolved in some parts of Britain.

Widespread in lowland Britain, Europe, Asia Minor, Iran, Iraq, North Africa and Madeira.

CUCURBITACEAE

***Bryonia dioica*. White bryony.**



Tetrad 43A (Hall 1980), possibly outside our area.

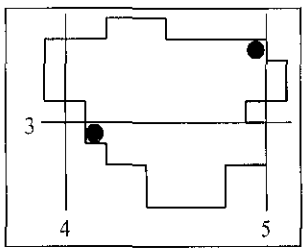
We have one record from the Newnham area, probably Chillies Lane (49.28), 1994, RN & ER. It is a long-lived perennial which climbs up to the light through other vegetation and tends to occur in hedges, scrub and open woodland.

In Sussex it is very common on the chalk and occasional elsewhere, sometimes on introduced soils. It is widespread in lowland Britain on calcareous soils, and in much of Europe except the north. It is also found in western Asia and North Africa.

This is the only native member of the Marrow family. The fruits are red and poisonous to man.

SALICACEAE

***Populus alba*. White poplar.**

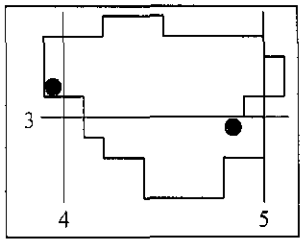


Planted at Chelwood Gate (41.29) and near Friar's Gate (49.33), but not naturalized.

Scattered in Sussex (Hall 1980). Native in southern and eastern Europe, eastwards across most of Asia and in North Africa where it grows in woodlands, along rivers and on lake sides.

The timber is tough and fine-grained, and is an important industrial wood in the Near East. In Britain it is mainly planted for ornament and landscaping, and one of the commonest cultivars has a twisting and leaning stem so that the whole crown leans to one side (Jobling 1990).

***Populus* × *canescens*. Grey poplar.**



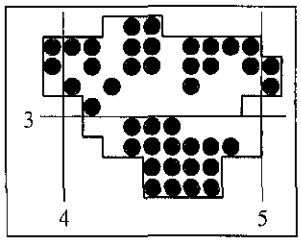
Between Millbrook and Old Lodge, S. Stewart, 1970s, not noted recently.

Recorded in two squares and spreading by suckers, but not naturalized; Twyford (394.311), 1994, DB; 48.29, 1995, Flora group.

It grows on a wide range of soils including moist, heavy clays, and acidic or alkaline soils provided they remain moist during the summer. It is not tolerant of dry heathland soils (Jobling 1990).

Scattered in Sussex (Hall 1980), and widely established in lowland Britain, possibly sometimes originating *in situ* where different sex trees of the parents grow in close proximity (Jobling 1990). It is also widespread across Europe and Western Asia.

***Populus tremula*. Aspen, Aps.**



Common on the Forest (Hall 1980).

Our records are remarkably clustered, perhaps indicating colonisation of the Forest from around the edges; it is a palatable tree and would have been rare whilst the Forest was grazed. It readily invades open, acidic soils on the Forest, but rarely as a pioneer, and is often found in the open edges of oak-birch woodlands. Once established, the tree produces suckers which spread out from the parent plant with leaves which are a different shape and hairy. It is not tolerant of shade and is rarely found in closed canopies.

Widespread in Britain on acidic soils and damp clays, and it occurs throughout Europe and Asia.

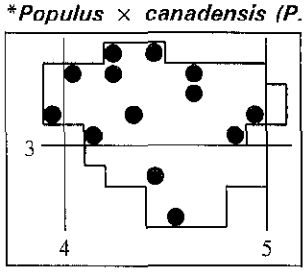
A small, easily-overlooked tree. The leaves fluttering in the wind can often be heard before it is seen. In the spring the male catkins look like big furry caterpillars. In autumn the leaves turn a brilliant yellow and can be easily spotted from the car.

[***Populus nigra*. Black poplar.**

There is one record of a Lombardy poplar (*Populus nigra 'Italica'*) in 48.30, but it is not naturalized.

No native black poplar (*Populus nigra* var. *betulifolia*) occurs in the flora area but four venerable spinsters can just be seen by the Medway at Forest Row, where they were first found by PS in 1986; one was lost during the 1987 storm. Poplar Farm is situated near Poundgate.]

***Populus* × *canadensis* (*P. deltoides* × *nigra*, *P.* × *euramericana*). Hybrid black-poplar.**



Tetrad 42P (Hall 1980).

We have many records of planted trees. It cannot naturalize as all the plants are male!

It is widely planted throughout Britain. The hybrids appear to have originated in Europe after *P. deltoides* was introduced from North America, and there are now many cultivars which we have not attempted to separate (see Jobling 1990, Stace 1991).

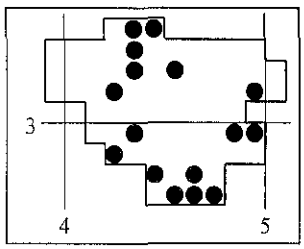
***Salix*. Willows and Osiers.**

Our guide for identification of willows has been the excellent BSBI willows and poplars handbook by Meikle (1984). Most hybrids have been identified by TR who took a fairly broad view reflecting the variation seen in the field.

Willows were taken from the Forest under the right of estovers and used for fuel.

Willows have separate male and female trees, but we have not investigated the proportions of male and female plants for most species yet. The male catkins add splashes of yellow to the Forest in early spring but last for only a few days each.

***Salix fragilis*. Crack willow.**

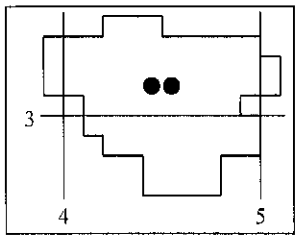


Occasional around the Forest (Hall 1980).

We have recorded this tree quite widely, often planted near farms and ponds around the edges of the Forest, but it is not common. A few trees occur along the Medway, but in general our rivers are too small to have the usual pollards along their banks.

Widespread in Britain (where it is not shown as native in *Atlas Florae Europaeae*) and Europe through to western Siberia and Iran. Increasing in England (Rich & Woodruff 1996).

***Salix alba*. White willow.**

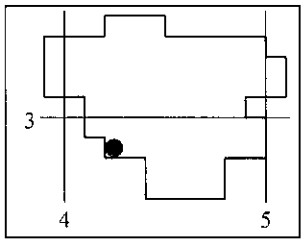


Tetrads 43F, 43H, 43M and 53A (Hall 1980), probably mostly outside our flora area.

We have only recorded it twice as single trees planted in Pippingford Park 448.312, SBRS and at 453.316, MM & ER, both 1995.

Widespread in Britain and native in much of Europe east to central Asia.

***Salix* × *sepulcralis (S. alba* × *babylonica)*. Weeping willow group.**



One tree planted in Maskett's Wood with other introductions by pond (428.285), 1995, Flora meeting, but not weeping very much.

Occasionally established in Britain, but probably not truly naturalized. It probably originated in cultivation. *S. babylonica* is native in China and does not survive well in our climate.

***Salix triandra*. Almond willow, French willow.**

Recorded in tetrad 42T in Hall (1980), possibly from around some of the ponds near Oldlands Hall or Marlpits at Fairwarp, but not refound.

This willow is one of the main species used for basket-making. There is an excellent display of willow cultivars used for baskets at Wakehurst Place, which also describes the techniques used to produce different coloured twigs.

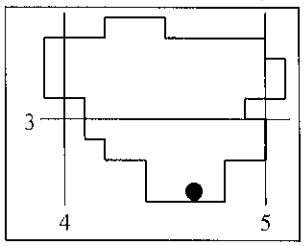
It is scattered in lowland Britain and widespread in Europe, and also occurs in temperate Asia and Algeria.

***Salix viminalis*. Osier.**

Tetrads 42N and 43H (Hall 1980), but not refound (the latter record may be from outside our area along the old railway line at Forest Row).

Widespread in Britain and native in much of Europe to Himalaya and Japan. Increasing in England (Rich & Woodruff 1996).

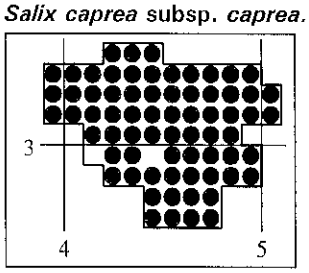
***Salix* × *sericans (S. caprea* × *viminalis)*. Broad-leaved osier.**



A young tree by the pond at Marlpits, Fairwarp (467.263), 1993, TR & NM, was provisionally identified as this, but it had been coppiced and the twigs used to make a new fence when we went to double-check it in 1995. We will have to visit it again in a few years.

It is a frequent hybrid willow in Britain and Ireland, and may arise spontaneously. It was also planted for coarse basket work (Meikle 1984).

***Salix caprea* subsp. *caprea*. Goat willow, Sally.**



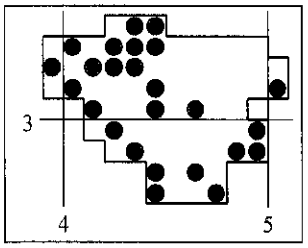
Common on the Forest (Hall 1980).

Recorded by us in nearly every square where it typically occurs on the edges of heaths and scrub, and avoids the acidic podzols. At Broadstone Farm, 80% of the goat willows were lost in the 1987 storm resulting in concern for the purple emperor butterflies which feed on *Salix* (*AFN* 14: 14-17), but they are still present.

In Forest Row in 1995, a tree 10 metres tall produced thousands of seeds which were shed with their fluffy down with green seeds into the drying wind over a period of about three days in June, giving the impression of light snow. About two seeds were found per square centimetre on open soils 20 metres down wind, about half of which germinated immediately (*Salix* seeds are reputed to only live for a few days). Surprisingly, many grew well despite the drought, and by the end of July there were densities of about one per square centimetre, which then rapidly declined until only two or three per square metre remained by the end of August.

Widespread in Britain (increasing in England; Rich & Woodruff 1996) and in Europe east to central Asia.

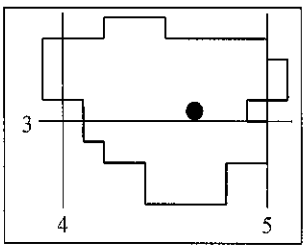
***Salix* × *reichardtii* (*S. caprea* × *cinerea*).**



This hybrid is either very common or very uncommon depending on which characters are used to identify the parents and therefore the hybrid. Plants with dark reddish-brown twigs and broad, softly hairy leaves as described by Meikle (1984) are quite widespread on the Forest and were recorded by TR with enthusiasm in 1993, less so in 1994, and in a more perplexed state in 1995.

It is probably very common in Britain, and is linked to both parents by a series of intermediates (Meikle 1984).

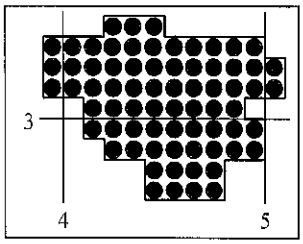
***Salix* × *capreola* (*S. aurita* × *caprea*).**



One bush recorded in heathland area away from both parents at Old Lodge (c. 468.306), 1994, TR & DK, and another unconfirmed one on the lane to Chestnut Farm (447.272), 1994, TR.

It is occasionally recorded in Britain where the parents meet.

***Salix cinerea* subsp. *oleifolia*. Grey willow.**

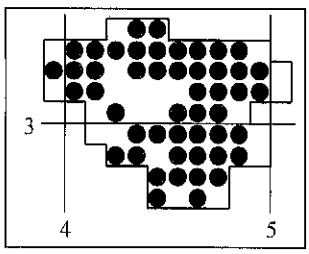


Common on the Forest (Hall 1980).

We have recorded it in every square. It occurs on roadsides, on open heathland on damp and dry soils, on woodland edges, around ponds and flushes, and in a few hedges. The rusty hairs under the leaves are more noticeable later in the season, and help distinguish it from the other species.

Salix cinerea is widespread in Britain and Europe, but subsp. *oleifolia* is a western European endemic restricted to Britain, Ireland, western France, Spain and Portugal (Meikle 1984). It is one of the commonest willows in Britain and is increasing in England (Rich & Woodruff 1996).

***Salix aurita*. Eared willow.**

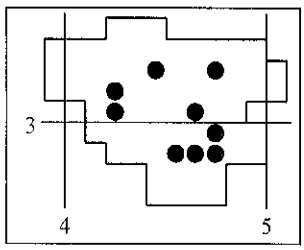


Ashdown Forest, 1901, T. Hilton (**BTN**). Principally on the slopes of Ashdown Forest (Done 1914). Common on Ashdown Forest and on other wet heathy areas in the High Weald (Hall 1980).

This species is locally common in wet *Molinia* flushes and heathland around the Forest, though oddly rare in the Pippingford Park area. It has small, crinkled leaves which are twisted to one side at the tip.

Widespread in Britain, and in central and northern Europe.

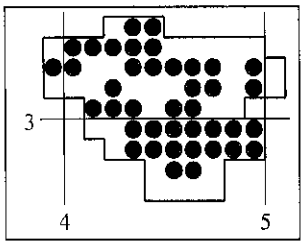
***Salix* × *multinervis* (*S. aurita* × *cinerea*).**



We have nine records for this hybrid, usually from where the parents occur together.

It is probably widespread in Britain, and also occurs in Europe.

***Salix repens* var. *repens* (var. *ericetorum*). Creeping willow.**



Ashdown Forest, plentifully (Coleman 1836). Forest Row, 1910, Miss P. Stockdale (**BEX**). Plentiful on Ashdown Forest (Done 1914). Ashdown Forest, near Poundgate, A. H. Wolley-Dod (Wolley-Dod 1937). Near Nutley, 1957, R. A. Boniface (BRC). Common on Ashdown Forest, its main Sussex headquarters (Hall 1980).

We have found it quite widely on rides, on open heath and on the golf course where it often occurs in the roughs but not on the fairways as close mowing eliminates it. It flowers in March and April when the male catkins can be conspicuous, and then later, female plants appear to be dabbed with cotton wool as the pods open to release the seeds in June.

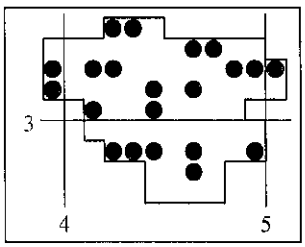
Widespread in Britain, and decreasing in England (Rich & Woodruff 1996). Mainly in western Europe and thought by some to be endemic.

***Salix* × *ambigua* (*S. repens* × *aurita*).**

This hybrid was noted by Parsons in Clark (1903), probably from the Forest. There are many bushes which at first sight appear to be this at Duddleswell (460.286), but on closer examination are probably all small *S. aurita*, and the hybrid remains unconfirmed. Meikle (1984) suggests it may be quite widespread in Britain.

BRASSICACEAE

***Sisymbrium officinale*. Hedge mustard.**

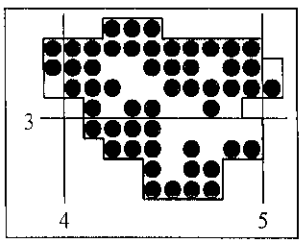


Eight tetrad records mainly from around the Forest (Hall 1980).

Scattered around the Forest, rarely in quantity, often in the villages or on roadsides, but not in hedges despite its name. It is common on disturbed, often nutrient-rich soils.

Widespread in Sussex, Britain, Europe, the Near East and North Africa.

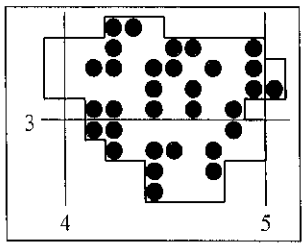
***Alliaria petiolata*. Garlic mustard, Jack-by-the-hedge.**



We have recorded it quite widely often in nutrient-rich, often damp places on roadsides, hedges, partly-shaded wood edges, and in the villages. It sometimes grows as a weed in gardens.

Widespread in Sussex, Britain, Europe, Asia and North Africa. It may be increasing in the countryside in general due to fertiliser drift from farm land.

***Arabidopsis thaliana*. Thale cress.**

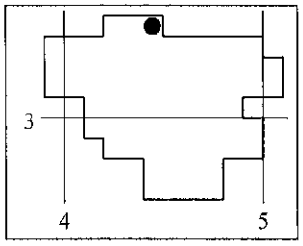


Eight tetrad records on the Forest (Hall 1980).

Scattered around the Forest on dry roadsides, car parks and in urban areas, usually on disturbed soils. It is an annual which flowers mainly in spring and early summer, but in the wet summer of 1993 a second generation flowered in late summer and autumn.

Widespread in Sussex, Britain, Europe, Asia and East Africa.

***Erysimum cheiranthoides*. Treacle mustard.**

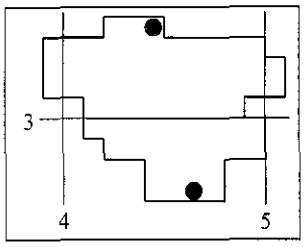


Tetrad 42T (Hall 1980).

Four plants on track at field edge north of Lines Farm (444.348), 1995, TR *et al*. The leaves are rough to the touch (like fine sand paper) due to the appressed hairs.

This is an annual plant of light, sandy soils, mainly in eastern England and scattered elsewhere. In Europe it is widespread except in the south. It also occurs in North Africa, northern Asia and North America.

***Hesperis matronalis*. Dame's-violet.**

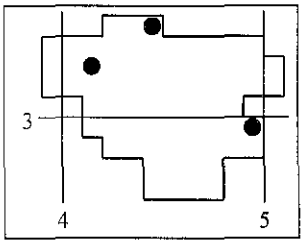


Scattered down the Medway near Forest Row for many years (e.g. tetrads 43H and 43M in Hall 1980).

Dumped soil on roadside at Marlpits corner, Fairwarp (467.265), one spike in 1994, two in 1995, B. Hoath & A. Main; garden escape near Lines Farm (44.34), 1993, TR & EL.

This species is now widely established in the countryside, often along rivers, and is increasing in England (Rich & Woodruff 1996). Eric Philp suggested that it increased dramatically in Kent a few years after seeds were distributed with a women's magazine (pers. comm. 1987). It is probably native in southern Europe and Asia but is widely introduced.

***Barbarea vulgaris*. Wintercress, Yellow rocket.**



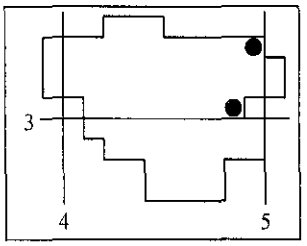
Four tetrad records in Hall (1980).

We have records from Warren car park (415.320), 1994, TR; banks of the Medway (44.34), 1995, TR & PA; and Poundgate/Training camp area (49.29), 1995, RN.

Widespread in Britain on riverbanks (possibly the native habitat) and on waste ground. Widespread in Europe, Asia and North Africa.

Wintercress and other cresses were once important parts of the winter diet of peasants in the sixteenth century when scurvy was a widespread, predominant disease (Drummond & Wilbraham 1939). The cultivated wintercress is now American wintercress (*Barbarea verna*) which tastes nicer.

***Barbarea intermedia*. Medium-flowered wintercress.**



A few dwarf plants in closely grazed pasture near Greenwood Gate (482.305), 1995, TR, an odd habitat; Friar's Gate, a swath in a field of new grass (499.333), 1988, PW & RW.

Rare and scattered in Sussex, often associated with construction works, and increasing in England (Rich & Woodruff 1996). Scattered throughout Britain, and native in southern and central Europe.

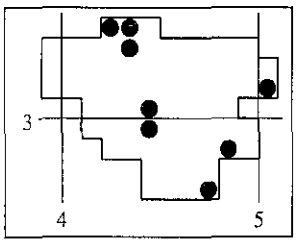
***Rorippa nasturtium-aquaticum (Nasturtium officinale)* agg. Watercress group.**

This aggregate is composed of *Rorippa nasturtium-aquaticum s.s.*, *R. microphylla* and the hybrid between them, *R.* × *sterilis*. It is difficult to identify non-fruiting material, and consequently most records are for the aggregate.

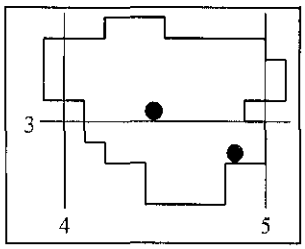
Recorded in tetrads 42Z and 43R in Hall (1980), the former re-recorded.

It makes good sandwiches to take on 'expotitions' on Ashdown Forest.

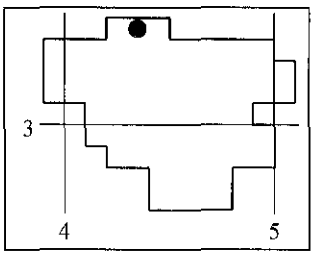
***Rorippa nasturtium-aquaticum* agg.**



Rorippa nasturtium-aquaticum s.s.



Rorippa* × *sterilis



***Rorippa nasturtium-aquaticum (Nasturtium officinale) sensu stricto*. Watercress.**

Confirmed from two squares, and probably the commonest taxon in wet places, ditches and on pond edges.

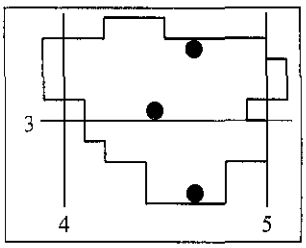
Widespread in Sussex, Britain, Europe, western Asia and North Africa and widely cultivated throughout the world.. Most watercress cultivated in Britain is derived from American seed; the wild watercress is much more tasty than the cultivated plants, which like most things American are bigger and greener, and have no sense of culture.

***Rorippa* × *sterilis (R. microphylla* × *nasturtium-aquaticum)*. Hybrid watercress.**

Pond on edge of golf course at Forest Row (436.342), 1993, TR. The pond was dredged in 1995 and the plant was missing.

Very scattered in Sussex and Britain but probably under-recorded, and sometimes also mis-identified for sterile forms of either parent. Widespread in Europe, and also cultivated throughout the world.

Rorippa sylvestris. **Creeping yellow-cress.**



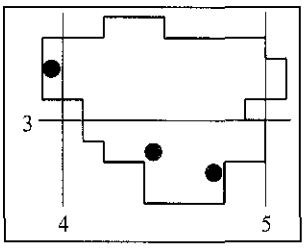
Tetrad 42Z (Hall 1980).

Weed in imported soil, Pippingford Park (444.303), 1993, TR; weed in vegetable patch around old well, Fairwarp (469.268), PD & RN, 1995; weed in drive, Marsh Green (465.333), 1994, PC, HP & Hazel Pollard.

Scattered in Sussex and Britain. Native in Europe, and now widespread through the world.

A variable species, with two main chromosome races; tetraploids are probably the native form on river banks, shingle and lake shores, whilst the larger more robust hexaploids are widespread as persistent weeds.

Armoracia rusticana. **Horse-radish.**

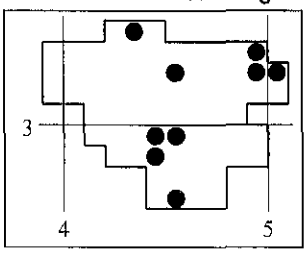


Four tetrads in Hall (1980).

We have recorded it three times probably where it persists as a garden escape. The grated root is used for horse-radish sauce - beware of fresh material which is considerably more potent than the processed versions!

Widely introduced in Sussex and lowland Britain and possibly native in south-east Europe and western Asia. It is largely sterile and spreads vegetatively.

Cardamine amara. **Large bittercress.**



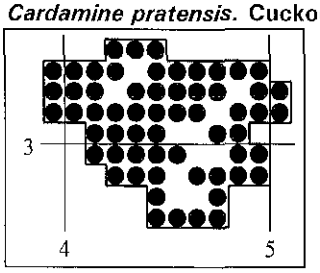
Tetrad 43L (Hall 1980).

Widespread and locally abundant, as for instance at Newbridge bog where a typical place to find it is around the edge of an iron flush or on the stream bank.

It can be confused with *C. pratensis* but has blackish-purple anthers, and the stems tend to creep and root at the nodes to form small patches. It is rarely fertile (possibly as it is self-incompatible), and the fruits that were seen at Newbridge in 1995 were predated by insect larvae. Plants at Friars Gate were also found in fruit, PW.

It is occasional in the Weald, and is remarkably rare south-west of a line from Portsmouth to Liverpool and in north-west Scotland. It is widespread in Europe.

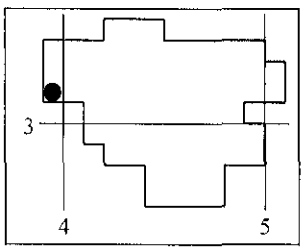
Cardamine pratensis. **Cuckoo-flower, Lady's smock, Milkmaids.**



Common on the Forest (Hall 1980).

Recorded in most squares, though absent from the more acidic parts and heathland. Locally frequent in old woodland and meadows, probably as different genotypes. A very variable plant in Britain and Europe where it is widespread. It also occurs in northern Asia and North America.

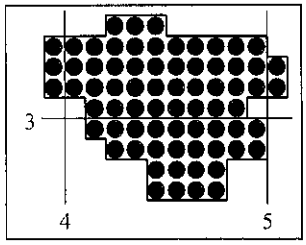
Cardamine* × *fringsii (C. flexuosa* × *pratensis, C.* × *haussknechtiana). **Bevan's bittercress.**



One plant with very pale pink flowers was found by DB with both parents in 1994 at Horncastle Wood (394.315), but did not persist into 1995.

This hybrid may be quite overlooked in Britain - plants of *C. pratensis* with small flowers which may be pale pinkish-purple or white should be examined carefully and compared with local populations of both parents. It appears to originate from local populations where the parents meet (e.g. Bevan & Rich 1991).

***Cardamine flexuosa*. Wavy bittercress.**

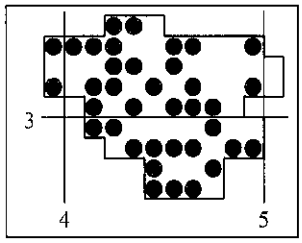


Common on the Forest (Hall 1980).

We have recorded it in every square in its typical habitats. It is common in open, damp, shady places such as riverbanks and shady flushes in Britain, and as a garden weed especially in the north and west. It is increasing in England (Rich & Woodruff 1996) and is widespread in Europe and across Asia.

It probably arose as a hybrid between *C. impatiens* and *C. hirsuta*, and consequently is difficult to tell from the latter which also occurs on the Forest. *C. flexuosa* has flowers with usually six stamens, hairy stems and four or more stem leaves. *C. hirsuta* usually has most flowers with four stamens, glabrous stems and 1-4 stem leaves.

***Cardamine hirsuta*. Hairy bittercress, Hairy-leaved Lady's smock.**

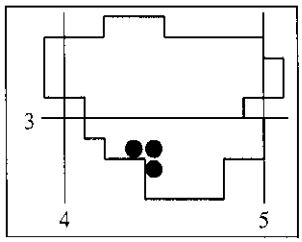


Frequent on the south-east side of the Forest (Hall 1980).

This species is much less frequent than *C. flexuosa* on the Forest and may have been a little over-recorded, but after the 1995 drought plants appeared in many places on verges and banks where they had not been seen before. It is much more a plant of dry, sandy places, wall tops and rocks, and often as a garden weed, and the predominantly damp, silty soils of the Forest may suit *C. flexuosa* more.

Widespread in Britain and most of the northern hemisphere. Increasing in England (Rich & Woodruff 1996).

****Lunaria annua*. Honesty.**

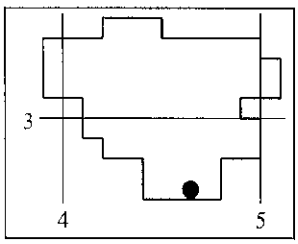


Recorded from three squares around Nutley, where the plants are garden escapes.

It is occasionally naturalized in Sussex (Hall 1980) and is probably increasing in Britain (Rich & Woodruff 1996). Probably native in south-east Europe, but now widely spread through the world.

The most significant feature of this plant is that the fruits are used as TR's logo!

***Erophila verna sensu lato*. Common whitlowgrass.**



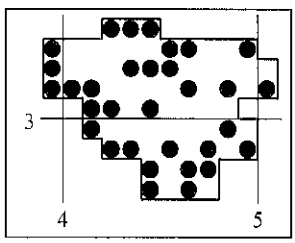
Tetrad 42T (Hall 1980).

Two plants of *E. verna* var. *verna sensu* Filfilan & Elkington on the gravel, Fairwarp Church (466.267), 1995, TR. *Erophila* has been present in the churchyard from at least 1985, and this site could also be the origin of the record in the *Sussex Plant Atlas*. It is an early-flowering annual of dry sandy places, walls and anthills and is easily overlooked, but it does seem to be absent or very rare on the Forest.

Erophila sensu lato is widespread in dry open habitats in Britain and Europe. The taxonomy of this group has now been clarified by Filfilan & Elkington in Rich (1991) but the distribution of the taxa still requires elucidation.

In Sussex, *E. verna s.s.* is the commonest taxon, with a few records of *E. glabrescens* from dry soils. There are very few records of *E. majuscula*.

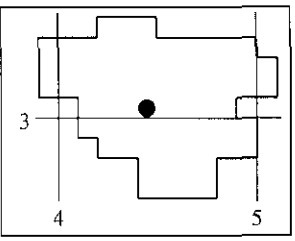
****Capsella bursa-pastoris*. Shepherd's-purse, Pickpocket.**



We have records of this annual weed scattered around the Forest on roadsides, gateways, gardens and waste ground in disturbed open places. It generally occurs as groups of a few plants.

Ubiquitous in Sussex (Hall 1980). It is a common cosmopolitan weed.

Thlaspi arvense. **Field pennycress.**



Tetrads 43K and 53B (Hall 1980).

Dumped soil in Pippingford Park (444.303), 1993, SBRS.

Once a frequent weed of sandy ground and heavy clays, but now less common due to herbicides. It is still reasonably widespread in lowland Britain, Europe, Asia and North Africa.

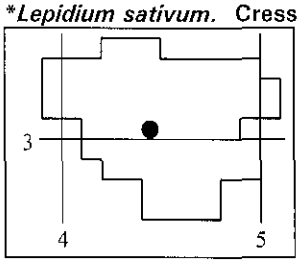
Iberis amara. **Wild candytuft.**

Near Poundgate, Crowborough, doubtless imported with rubble, E. D. Morgan (Wolley-Dod 1937).

This is a Nationally Scarce Species in Britain (Showler 1994), which has always been rare in Sussex. Its occurrence on imported rubble is of interest but where did the chalk come from? Firmin (1890) noted chalk was brought to spread on the fields by a team of twelve donkeys from Short Bridge to the Warren Estate up to three times a week at one time (*AFN* 27: 18). Short Bridge was the end of the Ouse Navigation where chalk was brought by canal from the South Downs. Leppard (1980) also noted that chalk was brought from Lewes to East Grinstead. However, *Iberis* is only a rare casual on the South Downs and is unlikely to have come from there. Coleman (1836) recorded *Anthyllis* was probably brought to Imberhorne with chalk from Godstone so we know chalk for roads was brought some distance, but *Iberis* is also rare in Surrey and occurs mainly in the Box Hill area. We will probably never know.

It is native in west and southern Europe and North Africa.

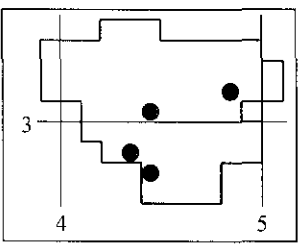
Lepidium sativum. **Cress.**



One plant at Home Farm, Pippingford Park (443.304), 1993, TR & PD. The cress of 'mustard and cress', but more likely to have come from bird seed than out of a sandwich.

A rare casual in Sussex but possibly under-recorded, and frequently mis-identified as other *Lepidium* species. Scattered in Britain and Europe, and probably native in Egypt and western Asia.

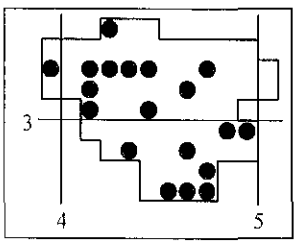
Coronopus squamatus. **Swine-cress, Star of the earth.**



Four scattered records, from clays around Nutley, imported with soil in Pippingford Park and a roadside near Faggot Stack Corner. It usually occurs in gateways and waste ground, often on clay soils.

It is probably native in south-east England and much of Europe.

Coronopus didymus. **Lesser swine-cress.**



Five tetrad records on the Forest (Hall 1980).

We have it scattered around in gardens, waste ground, car parks and on dumped soil. It has spread widely in Sussex and the British Isles since first introduced in the early eighteenth century, and is still increasing (Rich & Woodruff 1996); it has even reached the remote islands off the south-west Irish coast.

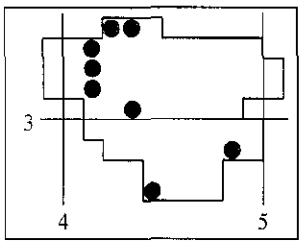
Nobody knows for sure where in the world this plant originated from, but it is now a cosmopolitan weed.

Diplotaxis tenuifolia. **Perennial wall-rocket.**

Recorded in Hall (1980) in tetrad 42N (Nutley, which must be from our area), 43H (old railway line at Forest Row outside our area) and 53A, probably Crowborough.

Not refound. It is doubtfully native in Britain usually being associated with commerce and habitation, and probably originated in southern and central Europe.

Brassica napus.* **Oil-seed rape.

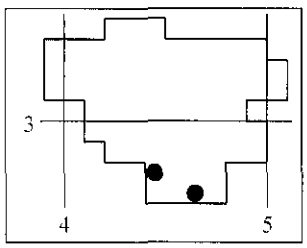


Our records are from road verges where the seeds get blown off the back of lorries, and no crops were noted in the area during the survey. At King's Standing it was introduced with imported soil in 1995. The roadside plants do not persist, and none have been observed setting fruit so it is not currently considered to be naturalized.

The apparent scarcity of records for Sussex in Hall (1980) compared to the frequency with which we have recorded it probably reflects the huge increase in the amount of oil-seed rape cultivated for the subsidies in recent years. It is increasing elsewhere in England too (Rich & Woodruff 1996).

Fields of oil-seed rape are often blamed for causing hay fever, but it seems the irritation arises from the chemicals given off by the flowers rather than allergy to the pollen.

Brassica rapa.* **Turnip.

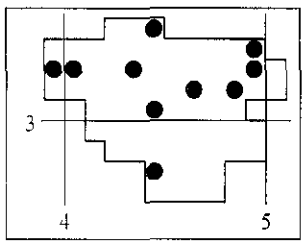


Tetrad 42Z (Hall 1980).

Recorded on disturbed soil by the A22, Nutley (44.27), 1994, TR; 46.26, 1994, PD & RN. As a native this probably occurs on river banks, but has been widely introduced with soil or seed.

It is widespread in Britian and Ireland, and is native in Europe and Asia.

Sinapis arvensis. **Charlock, Cadlock, Kelk.**



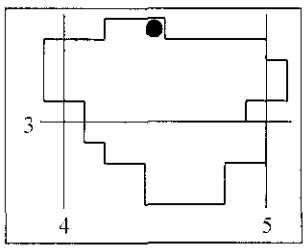
Frequent on the Forest (Hall 1980).

We have a few scattered records mainly from roadsides and disturbed ground, and very few records from arable land which is an uncommon habitat in our area.

It is a variable plant and was once a pernicious weed but it can now be eradicated with herbicides.

It is widespread in Britain, Europe, Asia and North Africa.

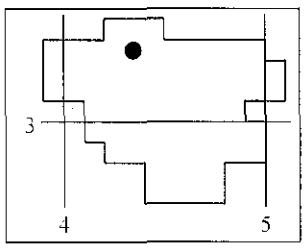
Sinapis alba* **subsp. *alba.* **White mustard.**



A few plants in Upper Parrock Farm yard (449.347), 1994, TR, gone by 1995.

The mustard of 'mustard and cress', but now usually grown as a green manure. Quite uncommon in Sussex and mainly on basic soils (Hall 1980), and scattered through Britain often as a relict of cultivation. Probably native around the Mediterranean.

Hirschfeldia incana.* **Hoary mustard.

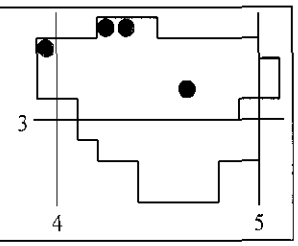


One plant recorded on cinder path on golf course, Forest Row (437.339), 1995, TR, the last new species to be added to the flora.

Hirschfeldia is a typical plant colonising cinders and slag around power stations and industrial sites, and must have been imported to the golf course with the cinders used to make the paths. It has been spreading in Sussex in recent years, with a number of plants scattered on roadsides - possibly benefiting from the run of hot summers.

It is becoming widespread in southern Britain, and is native in southern Europe and the Near East.

Raphanus raphanistrum. **Wild radish.**



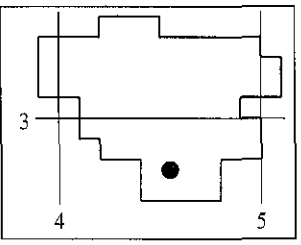
Tetrads 42U and 43M (Hall 1980).

We have four records from waste ground and arable land, usually as single plants.

It is mainly a weed of light soils in Sussex and is widespread but scattered in Britain. It also occurs in Europe, North Africa, Australasia and the Americas.

RESEDACEAE

Reseda luteola. **Weld, Dyer's rocket, Greenweed.**



Recorded in tetrad 42N in Hall (1980).

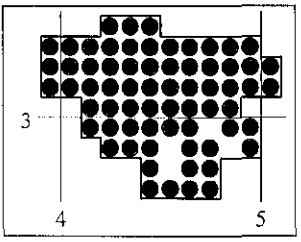
One plant on a bareish area on the north side of the bridleway east of Nutley (451.277), 1995, RN, the same tetrad as recorded by Hall.

It is commonest on the chalk in Sussex and on railway land, and is widespread in southern Britain, Europe, western Asia and North Africa.

Formerly cultivated for the yellow dye from its leaves.

ERICACEAE

****Rhododendron ponticum.*** **Rhododendron.**



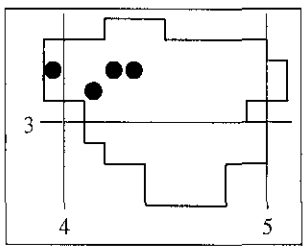
Common on the Forest (Hall 1980).

On the Forest rhododendrons are spreading into woodland from adjacent private properties where they were planted (*AFN* 17: 14-16). So far from their original home in south-western Europe and south-west Asia, they have largely escaped from their native pests and diseases and their thick, waxy leaves are virtually untouched by our native fauna. The American lace bug, another alien, is feeding on them in parts of southern England. Few insects seem capable of exploiting the flowers, though honey bees are known to collect the poisonous nectar.

Plants with wilted leaves were very noticeable in the drought of 1995, though adjacent bushes could be growing apparently normally. There were authorised sales by the Wood Reeve in 1980-1981 of rhododendron tips for flower arrangements.

The Conservators are fighting back to reverse the rhododendron invasion, by digging them up by the roots, or by the use of herbicidal sprays which include a strong wetting agent to penetrate the wax. Though some rhododendron can be found on the open heath, this has yet to reach the epidemic, hill-covering proportions found in other areas, such as Snowdonia. They are widespread in Britain and increasing (Rich & Woodruff 1996).

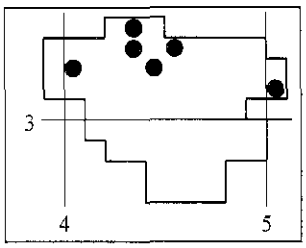
****Rhododendron luteum.*** **Yellow azalea.**



A large bush well away from houses, east of Dalingridge Farm (399.322), 1987, AK (Briggs 1990), and still there in 1994; one in Broadstone Warren (423.324), 1995, flora meeting; one on the boundary bank below the Ashdown Forest Centre (434.325) and one in the woodland opposite Hindleap Warren entrance (419.319), 1995, CM.

Inconsistently recorded in Sussex as an obvious garden escape (e.g. frequent on Blackdown, West Sussex but not previously noted, 1995, Rod Stern), and it can sometimes become established in abundance on acidic soils as at Burnham Beeches, Buckinghamshire. It is a native of Asia Minor and the Caucasus.

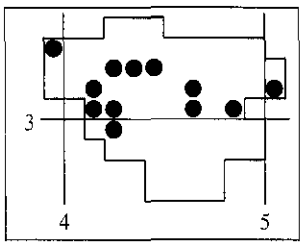
Gaultheria mucronata (Pernettya mucronata). **Prickly heath.**



Plants are occasionally naturalized, as near Goat cross-roads (401.327) in a damp marsh where it was first noted in 1988, PW and has been spreading since. It is grown in gardens and is either spread by birds or establishes from garden throw-outs. The berries are poisonous.

There are a few records from acidic soils in Sussex (Hall 1980), and it is naturalized most widely on moorland and in damp woods in Scotland and Ireland. It is native in South America.

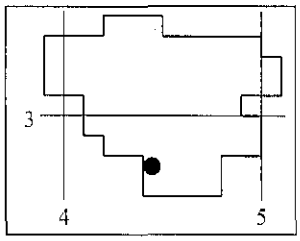
****Gaultheria shallon.*** **Shallon.**



Planted, as at the Old Lodge Estate as covert for the blackcock which were once bred there, for pheasants and other game, or escaped from gardens. A very large patch c. 10 metres across occurred in the National Trust woodland east of Wych Cross (423.322), but otherwise most patches are quite small. There are a few records from acidic soils in Sussex (Hall 1980), and it is also naturalized in Surrey especially on Leith Hill, and it is scattered elsewhere in Britain. It is native in western North America.

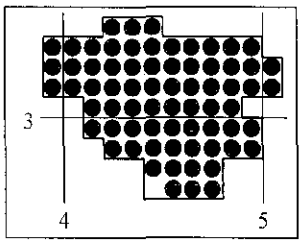
A hybrid between *G. shallon* and *G. mucronata* has been reported in Britain and should be looked for where the two plants occur together. Potential sites to search for the hybrid where the species grow near each other are near Goat cross-roads and woods near St John's.

****Enkianthus*** **species.**



Two plants of an unidentified species (possibly *E. campanulatus*) were recorded near houses, Nutley (447.272), 1994, AK & PD.

Calluna vulgaris. **Heather, Ling.**



'Customary tenants ought by custom to have heath, bracken and gorse to burn for the needs of their houses ' *Extent of Ashdown Forest* 1274. On the Forest (Firmin 1890). Ashdown Forest, with white form, 1910, Miss P. Stockdale (**BEX**). Common on the Forest (Hall 1980).

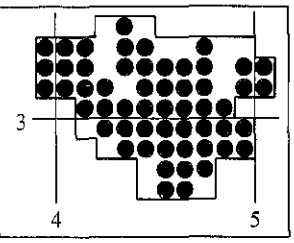
Heather used to be cut on the Forest for litter on a 10-12 year rotation (J. Walters, pers. comm. 1995). It was also reputedly used for making brooms which were so hard-wearing they were not commercially viable (i.e. no repeat sales), so birch was more generally used, with heather brooms only on the private estates. There have been recent authorised sales by the Wood Reeve of heather turves and thatching heather. The Ashdown Forest Centre was initially roofed with heather, but it rotted after a few years as it did not shed the water satisfactorily (one visitor asked if it bloomed every year! *AFN* **5**: 12-13).

Heather is particularly important as the principal component of heathland on Ashdown Forest today. It occurs on both wet and dry acidic soils, and soil pHs measured where it is dominant were 3.4, 3.6, 3.6, 3.7, 3.8, 4.0 and 4.6. Many invertebrates have evolved to live on it, including the silver-studded blue butterfly and the emperor moth. The Dartford warbler, a rare bird found on the Forest in good numbers when weather conditions allow, needs dry heath and often nests in *Calluna* with gorse. In order to maintain suitable conditions for it, current management on the Forest aims to maintain a mosaic of different ages. This is often achieved by cutting with a forage harvester, removing the litter to prevent mulching. However, most of the heather on the Forest is on ground which is not accessible by tractor, and is becoming senescent; these areas may be lost to birch invasion in the near future. White-flowered plants have been noted in 49.28, 45.30 and elsewhere.

Ashdown Forest supports a significant proportion of the Sussex population of silver-studded blue butterflies. These commonly feed on *Calluna* and *Erica* and can be seen on the wing in July and August (*AFN* 30:18).

Decreasing in England (Rich & Woodruff 1996), but still very widespread in Britain except the Midlands. Widespread in Europe except the south. Also found in Morocco and the Azores.

***Erica tetralix*. Cross-leaved heath.**

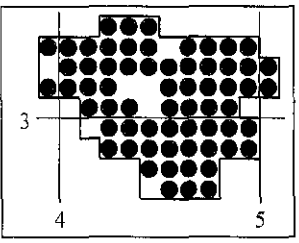


Ashdown Forest including white-flowered plants (Coleman 1836). Ashdown Forest, E. Jenner (Arnold 1887). On the Forest (Firmin 1890). Ashdown Forest, 1892, E. H. Farr (**BTN**). Ashdown Forest, white form, 1910, Miss P. Stockdale (**BEX**). Ashdown Forest (Done 1914). White form at Twyford (Dent 1928-1953). Common on the Forest (Hall 1980).

Surprisingly, cross-leaved heath has not been found in sixteen of the squares we have surveyed. It is restricted to the wetter heathy soils of the Forest, where it is found in association with *Molinia, Sphagnum* and low *Calluna* cover. Where apparently pure stands of *Calluna* have been mown in the past ten years, the regenerating heather now has a high proportion of *Erica tetralix*, as for instance near Gills Lap (466.314). It may be able to tolerate the effects of water-logged environments as it is shallow-rooted, but freedom from competition from *Calluna* and *E. cinerea* which do not tolerate the conditions well is also important is allowing it to dominate the vegetation.

Decreasing in England (Rich & Woodruff 1996). Widespread on suitable acidic soils in western Britain, rarer in the east. A western European endemic.

***Erica cinerea*. Bell heather.**



Ashdown Forest, including white-flowered plants (Coleman 1836). On the Forest (Firmin 1890). Ashdown Forest, 1910, Miss P. Stockdale (**BEX**). Ashdown Forest (Done 1914). White forms at Twyford and Duddleswell (Dent 1928-1953). Common on the Forest (Hall 1980).

Bell heather was found in all but seven squares during the fieldwork, which is surprising because it is the least abundant of the three heathers on the Forest, occurring only in the driest areas. It is frequently found as scattered plants, often on the edge of fire rides where soil disturbance has resulted in drier ground. *Erica cinerea, E. tetralix* and *Calluna* can be found together particularly on rides.

The reproduction of bell heather by seed has been described by Bannister (1965). Plants will flower in July and early August from their second or third year onwards. Flowers may be self- or cross-pollinated. Ripe seed can be obtained as early as September, but most is shed in October and November. Each capsule contains 18-34 seeds (one third of which may be abortive), each plant producing on average about 5000 seeds. Seed dispersal is poor and seedlings usually occur near the parents. Seed germinates immediately it is shed, or intermittently thereafter and seeds may be long-dormant. Germination is stimulated by light, alternating temperatures and short heat shock (i.e. fires). A mycorrhizal fungus association with the roots appears to be essential to seedling survival, recycling nitrogen from the decaying litter to the heathland plants. Seedlings establish better on mineral than organic substrate, and on moist rather than wet soils.

Plants grow best in open conditions, but will tolerate shade down to 15% of daylight reasonably well and flower sparsely; between 15% and 7% of daylight it only survives as a straggly, weak, non-flowering plant. It often grows as an understory to heather, and will grow in open woodland but does not survive in deep shade. It does not germinate well on wet soils occupied by *E. tetralix* and is killed rapidly if the water table rises, perhaps due to sensitivity to ferrous ions in the ground water.

Still widespread in Britain on acidic soils but decreasing (Rich & Woodruff 1996). Mainly western in Europe.

****Erica vagans*. Cornish heath.**

The Crowborough record where it was recorded naturalized on forest land in the *Crowborough Guide 1930* was accepted by Wolley-Dod (1937); K. E. Bull reported that in 1972 the site at Camp Hill was much overgrown and it could not be refound (Hall 1980). Press Ridge Warren, near garden, 1945, G. Dent (Dent 1928-1953). It has not been seen recently and is probably extinct.

Currently it is native in Cornwall where it forms extensive heath on the Lizard, and appears to be a classic Lusitanian plant. However, according to F. J. Hanbury it grew luxuriantly in the rock gardens at Brockhurst, East Grinstead (Hanbury 1917) so it is perhaps not climatically limited to Cornwall. It is endemic to western Europe.

***Erica* sp.**

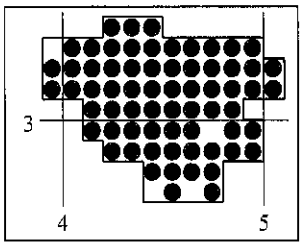
An unknown *Erica* was found on the edge of a path near Chelwood Vachery (c. 435.296), 1990-1994, NM & CM, but could not be refound when needed for identification. It will have to be checked again, and may be one of Winnie-the-Pooh's 'spotted or herbaceous backsons'.

***Vaccinium oxycoccos*. Cranberry.**

Bogs in Hindlip Warren, Ashdown Forest, on the eastern branch of the Kidbrooke stream, 31 August 1836 (Coleman 1836; **LIV**). Searched for several times in 1994 and 1995, TR, without success, the whole area now being woodland or dense rhododendron. Old maps indicate areas of *Sphagnum* bog where it could have occurred at Hindleap.

Cranberry is now a very rare plant in the Weald, with only three localities remaining in Sussex (Briggs 1990), two in Surrey and only a few sites in Hampshire in the Woolmer Forest area. *Sphagnum* bogs are generally very small and scattered in the south and prone to drainage or scrub invasion, and it has gone from most former sites in southern England but still lingers in Norfolk. It is more widespread in the north and west where there are larger areas of bog. In Europe it is widespread in the north and centre. It also occurs in Asia, North America and Greenland.

***Vaccinium myrtillus*. Bilberry, Hurts, Whorts.**



Ashdown Forest, 1842 (**BTN**). Ashdown Forest, E. Jenner (Arnold 1887). Ashdown Forest (Done 1914). Common on the Forest (Hall 1980).

We have recorded it from most squares with the exception of a few around the edge and the exposed hill top north-east of Camp Hill. Fruits are still collected locally for eating, for instance 2 kg were collected in 1985 (*AFN* 8: 20).

It occurs in two main habitats on the Forest; in the open heaths with *Calluna* especially where slightly damp and acidic (soil pHs measured were 3.2, 3.6, 3.8, 3.9, 4.0, 4.2), and in the woodlands. The woodland plants may be relict from former open heathland which has been colonised by trees, for instance north of Priory Road (410.338), and it is often found on slightly raised banks along streams (e.g. Kidbrooke, 416.335). Bilberry survives in shade better than *Erica cinerea* or *Calluna*, and spreads clonally to form some quite large patches. It is replaced on dry soils by *E. cinerea*, and may dominate on more disturbed soils as for instance on the bronze age barrow at Four Counties (467.312) where it is mixed with bracken.

Bilberry can also be a natural component of woodland on acidic, rocky soils in the Weald, and it can become dominant in woodland where there is no grazing. Sometimes in southern England the leaves are retained through the winter, and photosynthesis in both the leaves and the green stems during the winter may be important in helping the plants survive in woodland.

Its reproduction has been described by Ritchie (1956) and Welch *et al.* (1994). There are two flowering periods, one in spring and one in early summer. The first flowers can be found in March in mild winters on the Forest, often when there are only a few leaves on the plants. They are mainly insect-pollinated, and produce an average of 18 seeds per berry. The berries are eaten by birds (e.g. pheasants; Pickard 1930) and small mammals, but in Scotland seemed to be taken after they had fallen to the ground rather than from the bushes themselves. The seeds germinate best when given a cold treatment and light, and are short-lived with a marked drop in viability within three years. Seedlings are apparently rare in the wild, and most reproduction is by vegetative spread.

It is widespread on moorland and mountains in the north and west of Britain, and in the Weald, New Forest and on acidic soils around London, but is virtually absent from the Midlands. It is widespread in Europe and North Asia.

PYROLACEAE

***Pyrola rotundifolia* subsp. *rotundifolia*. Round-leaved wintergreen.**

Near Forest Row, 1 August 1935, Miss Parsons, confirmed by A. J. Wilmott (**BM**; dated '1937' in Wolley-Dod 1937). Small patch on sandy bank in Hindleap Warren with *Vaccinium myrtillus*, 1948, R. A. Boniface. "Lots of these perfect flowers ... decorate a bank" (Ross 1955). Ashdown Forest, O. Buckle, July 1958 (pers. comm. to DS). Photographed in perfect flower, 12 September 1965 (*Bulletin Kent Field Club* 11: 27). Tetrad 43B (Hall 1980). The last record we have traced was 3-4 spikes, 1978, F. Tebbutt; he monitored it for many years and it disappeared after a severe winter. It is probably extinct and no plants have been seen at this site for many years. With its loss from this site *P. rotundifolia* has become extinct in Sussex.

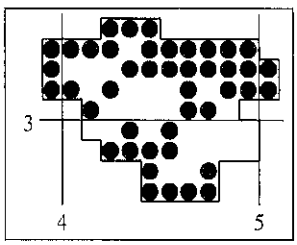
This site was on a bank of the road between Forest Row and Goat cross-roads (c. 406.334). A slide taken by F. Tebbutt in 1968 showed three spikes on a bank associated with *Vaccinium, Hedera, Lotus, Fragaria, Lonicera* and grasses.

This is a Nationally Scarce Species, which has only been recorded in 42 10-km squares in Britain since 1970 (Rumsey 1994). In the south it occurs in fens, dune slacks, chalk pits and under willow scrub, most of which are usually damp and calcareous, and in Scotland in pine woods, mountain ledges and the sides of burns. The site at Forest Row is certainly damp and north-facing but not very calcareous, which may explain why it did not persist as long as it has elsewhere.

It is also native in Europe, northern Asia and Asia Minor.

PRIMULACEAE

***Primula vulgaris*. Primrose.**



Common on the Forest (Hall 1980).

We have found it frequently around the edges of the Forest in old woodland, hedgebanks and sometimes on verges (e.g. replanted after disturbance on verge south-east of Chuck Hatch at 454.332). It has occasionally been planted out on the Forest too - a few plants occur by a lay-by on Ridge Road (442.325), and probably around a number of houses and farms. Pink-flowered plants were seen near Camp Hill (46.28), 1993, RN & ER, and 200 metres south-east of Balcombe Farm (390.312), 1995, TR, possibly a result of crossing with garden plants or possibly natural (Valentine 1975). An investigation of the ratios of the pin and thrum flowers near Fernhill by TR and Nick Hinson found 21 of each form.

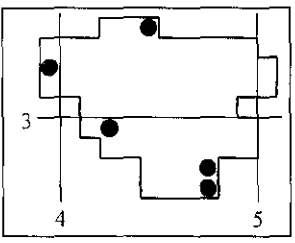
Prior to the First World War, primrose seeds were collected and sold to Carter's seed merchants, £1 for a pound weight of seed (Mrs E. Vernon, Horney Common, pers. comm. to MR).

Seed production is limited by pollination; although bees and butterflies have been observed to visit the flowers they do so only rarely, and they are probably pollinated at night by moths (Boyd *et al.* 1990). Helliwell (1980) found that germination was poor and few seedlings survived on acidic soils of less than pH 4.7, and soil pH is presumably the reason our plants occur around the edges of the Forest (three pH measurements were 4.9, 5.2 and 5.6). It does occur in the

centre of the Forest on alluvial soils in the river valleys, for instance, the alder woodland at Hindleap (417.331), and Salisbury (1970) showed the pH of such alluvial soils was usually higher than the surrounding land due to nutrient drift. Helliwell (1980) also found that seedlings were unable to emerge through dense litter - hence it tends to grow on banks. In dense shade (6% of daylight) it produces few flowers and little seed. Additional light in the spring can increase growth but summer light levels have a dominant influence.

Common and widespread in Sussex except near large areas of habitation, and widespread in Britain, western and central Europe.

***Primula* × *polyantha* (*P.* × *tommasinii; P. veris* × *vulgaris*).** **Common oxlip.**

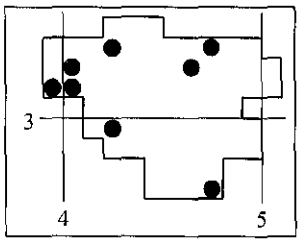


"In some districts, as I have seen near Hartfield in Sussex and in parts of Surrey, specimens may be found on the borders of almost every field and small wood" (Darwin 1867).

Spontaneous plants arose in the meadow at Braberry Hatch (428.296), 1994, Michael Taite. The garden polyanthus is probably of the same origin but has been much modified by cultivation. It is occasionally planted in churchyards or on banks as at Legsheath Lane (39.32), Parrock Lane (446.344), near Oldlands Farm (47.26), all 1995, TR, and near Brown's Brook (47.27), 1994, Flora meeting. Some plants have yellow flowers, others coloured.

Although primroses are usually pollinated by moths and cowslips by bumblebees (Darwin 1867) there are enough insects which visit both to get hybrids. Valentine (1979) noted that as viable seed was only obtained when *P. veris* was the seed parent the hybrids are usually found near to cowslip plants - as is the case with us at Braberry Hatch. Hybrids are recorded from throughout the British Isles where the parents occur.

***Primula veris*.** **Cowslip.**

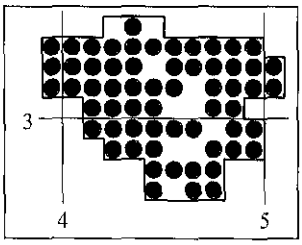


Occasional on the south-east side of the Forest (Hall 1980).

Native plants are very rare, only occurring on a path side at Twyford (394.311), 1994, DB; meadow at Braberry Hatch (428.296), 1994, Michael Taite; private meadows at Old Cherry Orchard (42.33), 1995, PS. Also noted by TR planted in several places on drive to Smockfarthing (40.31, 40.32), 1994; planted on verge outside Suntings (462.327), 1995; near garden, Fairwarp (470.263), 1993; verge outside Neaves Farm (477.336), 1993.

This plant occurs in old grassland on clayey and calcareous soils, hence is very locally distributed in our area. It has declined dramatically in lowland Britain, and is now mainly found on chalk. It is still widely distributed in England, and is much commoner in Europe.

***Lysimachia nemorum*.** **Yellow pimpernel.**

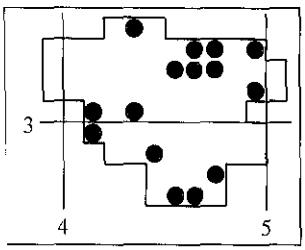


Common on the Forest (Hall 1980).

Widespread in most areas of the Forest, usually in damp and sometimes in quite wet woodland.

Widespread in the Weald and in Britain. Predominantly western in distribution in Europe.

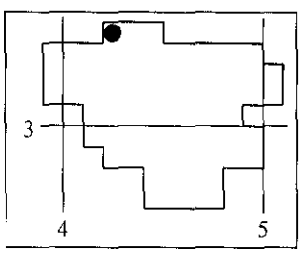
***Lysimachia nummularia*.** **Creeping-Jenny, Moneywort, Herb two-pence.**



Ashdown Forest, common, E. Jenner (Arnold 1887). Common on the Forest (Hall 1980).

We have it scattered on ditch sides, wet grassland and near habitation (probably an escape from cultivation in the latter), and there is a distinct cluster of records south of Chuck Hatch possibly where the soils are a little more clayey. It occurs predominately in south-east lowland Britain on wet, clayey or calcareous soils, and is widespread in Europe.

****Lysimachia vulgaris*.** **Yellow loosestrife.**

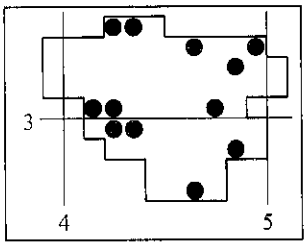


Recorded in tetrads 42T, 43L and 43R (Hall 1980), but surely over-recorded for *L. punctata* in the latter two tetrads?

We only have one definite record, an introduced plant in bramble on dry ground opposite house, Forest Row (423.340), 1995, DB & PD.

As a native species this occurs in calcareous fens, riversides and ditches. It is locally frequent in parts of lowland Britain, and more widespread on the continent and central Asia.

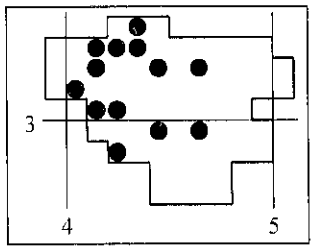
Lysimachia punctata. **Dotted loosestrife.**



This plant is quite widespread around habitation where it often survives when thrown out of gardens, and there is a large, conspicuous patch by the A22 at Millbrook (439.296).

It appears to be increasingly established in the wild, despite being apparently sterile (Clement & Foster 1994). It originates from Europe and south-west Asia.

Anagallis tenella. **Bog pimpernel.**

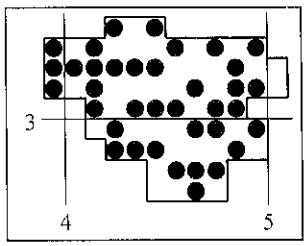


On bogs on Ashdown Forest, common (Forster 1816). Bogs on Ashdown Forest (Coleman 1836). Boggy places near Maresfield, W. C. Unwin, and Ashdown Forest, E. Jenner (Arnold 1887). Ashdown Forest (Done 1914). Ashdown Forest, Miss P. Stockdale (the specimen in **BEX** is labelled Forest Row, August 1910); Coleman's Hatch, H. S. Salt; near Chuck Hatch, E. D. Morgan (Wolley-Dod 1937). Near Kidbrooke Park, 1947, G. Dent (Dent 1928-1953). South of Chuck Hatch, 1950s, FR. Near Nutley, 1957, R. A. Boniface (BRC). Tetrads 42N, 43B and 43L (Hall 1980).

Now very scattered and isolated on the Forest. Large patches are present in a wet grassland by the lake at the Isle of Thorns (420.303 in both squares) where it is specially managed, 1992+, DS; frequent under *Juncus* at a spring by A22 opposite the entrance to Broadstone Warren (419.328), 1995, TR; two large patches in maze of wet paths, Chelwood Corner (427.287), 1994, TR; pond edge, Broadstone Farm (437.332), 1987, PD; golf course at Forest Row, at least three sites: (i) one large patch on ditch side (434.343) subsequently lost when ditch regraded, 1987, PS; (ii) stream side east of club house (433.341), 1995, PS & TR; (iii) two large patches each one metre long in ditch by path east of bridge (c. 429.339), 1995, TR & PA; abundant in flush now opened up by grazing, Millbrook (445.297), 1993+, NM *et al.*; one patch under rushes by path, near Dumpey's car park (445.327), 1983+, CM & NM *et al.*; very small patch on margin of pond, Camp Hill (468.298), 1988 & 1993, PW; standing water in brick structure in open heath north of Gills Lap (468.327), 1992, NM. It has also been recorded in woodland "opened up" by the 1987 storm behind Three Chimneys, Twyford (402.314), 1993, CM & NM, and near Kidbrooke stream (417.337), 1993, CM & NM.

It is rare and scattered in Sussex on wet acidic soils. It is commonest in western Britain, has a very western distribution in Europe and occurs in North Africa and the Azores.

Anagallis arvensis **subsp.** ***arvensis.*** **Scarlet pimpernel.**

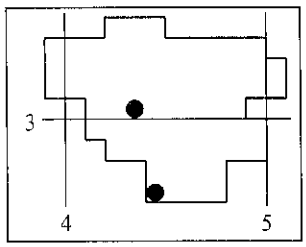


Common on the Forest (Hall 1980).

We have recorded it quite widely in the road gutters, car parks, waste ground and gardens, and the map shows a strong correlation with the minor roads. The blue form of subsp. *arvensis* was recorded at Old Lodge (457.302), c. 1990, DK but has not been seen again.

Widespread and locally common throughout the world apart from the tropics.

Anagallis minima (Centunculus minimus). **Chaffweed.**



On Ashdown Forest, in the Warren east of the Stone Quarry above Kidbrooke (Coleman 1836). On the Forest, near Maresfield, W. C. Unwin (Arnold 1887). An 'inseparable' with *Radiola* on tracks, Ashdown Forest (Pickard 1930). Near Wych Cross, Miss M. Cobbe; Wood near Crowborough, T. Hilton (Wolley-Dod 1937). Frequent in Broadstone Warren, 1948, R. Boniface. Tetrads 43G, 43Q, 43R and 43V (Hall 1980).

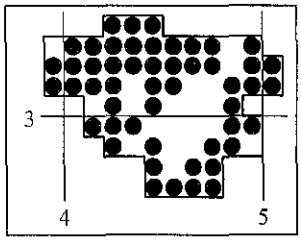
Only seen on a ride in Pippingford Park with *Wahlenbergia* (437.307), 1993, TR *et al.*, and abundant on ride in Funnell's Wood (441.262), 1995, TR & PA. Probably declining though it is markedly variable in abundance and appearance from year to year.

This is a small annual of damp sandy or clayey ground, and in the Weald is often found on woodland rides. It is self-compatible and flowers may be pollinated in bud. The variation in numbers from year to year is at least partly due to dormancy, with many seeds waiting for the right conditions before germinating. A small proportion of the seeds (0-4%) germinate in the autumn whilst the remainder germinate in the spring. The autumn plants can be quite robust and may produce over 400 fruiting capsules, but the vernal ones are often tiny and mostly have less than 10 fruits each. As each fruit contains an average of about 15 seeds, one autumn plant can produce as many seeds as 33 spring-flowering plants. The extended germination period is an adaptation to surviving in a habitat which varies in time (Salisbury 1969b, 1970).

It is predominantly a plant which occurs near the coast in Britain, except for the New Forest and the Weald, but is scattered through lowland Europe, south-west Asia, North Africa and the Americas. It is often associated with *Radiola linoides* which has a similar ecology, and both are decreasing in England (Rich & Woodruff 1996).

GROSSULARIACEAE

***Ribes rubrum*. Red currant.**



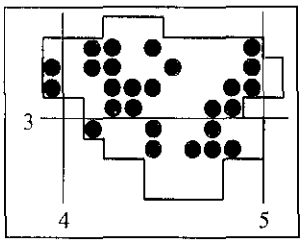
Common on the Forest (Hall 1980).

Usually found in woodland, often along stream banks in alder carr but also in scrub and hedges. Away from the valleys it is likely to have been spread from gardens by birds. It used to be grown at the Wych Cross fruit farm.

It is predominately western in distribution in Europe, but is widely introduced and it is virtually impossible to establish its native range. It is increasing in England (Rich & Woodruff 1996).

Some garden cultivars may be *R. rubrum* × *spicatum*.

***Ribes nigrum*. Black currant, Gazel.**



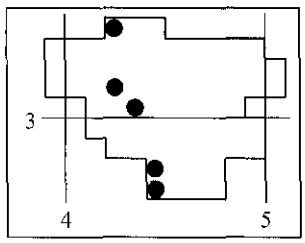
Crowborough Warren, 1899, E. Gilbert (**TLS**). Occasional on west side of the Forest (Hall 1980).

It is now quite widespread, often on wetter ground than the other *Ribes* species. It usually occurs on wet, rich alluvial soils in woodlands as shown in the east of the Forest, but it also occurs on quite dry roadsides around Wych Cross where it may have been bird-sown from the former fruit farm. Deer do not eat it.

In Sussex it occurs predominately on the Tunbridge Wells Sands and Lower Greensand. It is mainly northern in distribution in Europe, and is probably native in swampy woodland in eastern Europe and Asia. It is increasing in England (Rich & Woodruff 1996).

It can be picked out from a distance from *R. rubrum* by the more sharply, deeply lobed leaves; close up it has amber glands under the leaves (absent in other species). Rubbed leaves usually smell of black currant though oddly some black-fruited bushes opposite Wych Cross Nursery do not.

***Ribes sanguineum*. Flowering currant.**

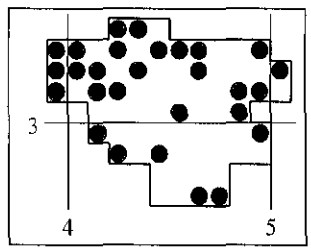


Scattered on roadsides and near habitation; one plant on roadside south of Nutley (448.267), 1994, TR, another east of Nutley (444.277), 1994, PD & AK, and another in Long car park (426.311), 1995, TR, and elsewhere.

Widely grown in gardens, and occasionally spreading into the wild throughout much of Britain, especially in the north and west, and is increasing in England (Rich & Woodruff 1996). It is native in western North America.

Garden plants with larger yellowish-pinkish flowers may be *R.* × *gordonianum* which could also occur.

***Ribes uva-crispa*. Gooseberry, Goosegog.**



Frequent on the Forest (Hall 1980).

Our records match the pattern shown by Hall. It is widely scattered in hedges and young woodland around the Forest, often near habitation.

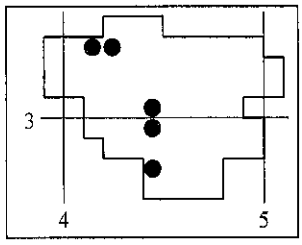
Widespread in Britain and Europe, and increasing in England (Rich & Woodruff 1996); it also occurs in Morocco. The form which is probably native in western Europe has short, dense, patent non-glandular hairs on the berries. Plants with a mixture of long glandular hairs and short hairs, or those with glabrous berries, are likely to be of garden origin. Plants with only glandular hairs on the berries occur in the Carpathians.

The first edition of Clapham, Tutin & Warburg's *Flora of the British Isles* had a minor printing error giving the size of the fruits as 10-20 cm instead of 10-20 mm; it was affectionately known as the giant gooseberry edition!

CRASSULACEAE

***Crassula helmsii*. New Zealand pigmyweed, Australian swamp stonecrop.**

No botanist has a good word for this Australasian species which is currently spreading rapidly in Britain. It probably initially spread as a throw-out from aquaria and garden ponds, and subsequently under its own steam. It grows in a range of water conditions from acidic to alkaline and even saline water, from 3 metres deep to 0.5 metres above the normal water level, and it seems to be virtually indestructible. Perhaps the first positive thing to be said is that a carpet of flowers in the pond at Tompset's Bank filled the air with a lovely scent of honey in June 1995.



We have found it in ponds at Kidbrooke Park (418.339), 1995, TR & PA; Tompset's Bank (424.338), 1995, PW; Pippingford Park, introduced with other aquatics (448.299 and 445.302), 1995, Flora meetings; established in a tiny stream in a meadow on slope east of Nutley Post Office (445.275), 1995, TR, a more unusual habitat.

There were only two records for Sussex in Hall (1980), but Briggs (1990) added 13 more, and there are even more now. It is now also widespread and increasing in England (Rich & Woodruff 1996).

Control measures were being investigated at Weir Wood reservoir in 1994, where there were vast areas lining the shore at the normal water line. Sheets of black plastic were pinned over areas which probably killed the plants by heat rather than shade; the *Crassula* had recovered by 1995. Other control measures suggested seem to involve major herbicide application, and it has yet to be eliminated from any site where it has become well-established. Another alien, *Hydrocotyle ranunculoides*, seems to be out-competing it at Piltdown Pond!

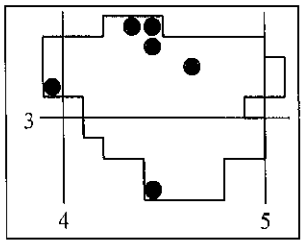
It seems to be insensitive to the weather. It survived the drought in 1995 at Weir Wood, turning slightly brown but recovered rapidly. The only other aquatic with it was *Littorella uniflora* which seems able to put its leaves up through the cushions. It grows throughout the winter and does not seem to be frost sensitive, probably in part because it is protected by the water.

***Sempervivum tectorum*. House-leek, Sengreen, Sungreen, Welcome home husband however drunk you be.**

Nutley, R. A. Boniface (Wolley-Dod 1937). Not refound in Nutley in 1995, PR.

Once frequent on the roofs of houses where it was planted in the belief it was a protection against lightning, but now rarely seen in Sussex (plants still survive on a roof nearby at Balcombe). Native in southern Europe where it occurs on rocky slopes in the lowlands and mountains, almost a habitat match for roofs and walls.

***Sedum telephium*. Orpine, Livelong.**



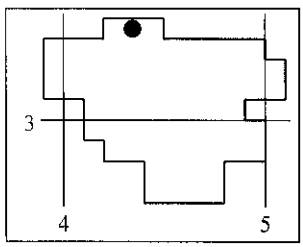
Ashdown Forest, M. R. Dixon, 1886 (Arnold 1887). Frequent on the Forest (Hall 1980).

Mainly recorded around the edges of the Forest, typically on hedge banks. Pathside, Horncastle Wood (394.311), 1994, DB; Forest Row, old railway line (43.34), 1987-1995 and spreading, PW; abundant along drive near Hunters Farm (447.264), 1994, TR; pathside south of Water Farm (441.335), 1995, PW; path, Forest Row (443.348), 1995, TR & PA; 46.32, 1993, TR & EL. We have not looked to see which subspecies occur - the characters seem to work better on dried material than in the field.

It does not seem to be eaten by rabbits - plants along the drive to Hunter's Farm were untouched despite still being green and fleshy whilst everything else had been nibbled to the ground during the 1995 drought. It is apparently eaten by sheep and goats but not by horses.

It is scattered in Britain in the lowlands, and although it will survive at altitude its growth rate is strongly dependent on temperature (Woodward 1987). Widespread in Europe, temperate Asia and North America.

***Sedum spurium*. Caucasian stonecrop.**



Garden rubbish, Forest Row (434.343), 1994, TR & NM, not surviving to 1995 as more rubbish was dumped on top.

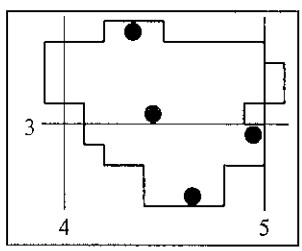
Native in south-east Asia. Occasionally established in Britain usually on calcareous rocks, and increasing in England (Rich & Woodruff 1996).

***Sedum acre*. Biting stonecrop, Poor man's pepper.**

Recorded in tetrad 42N in Hall (1980), presumably from Nutley (perhaps once on a roof with the *Sempervivum*) and not refound. An interesting species which is mainly a calcicole occurring on soils above *c.* pH 6.0, but quite widely recorded on walls and calcareous sands. It is also grown in gardens.

It is widespread in Britain. It occurs widely in Eurasia and North Africa.

***Sedum album*. White stonecrop.**



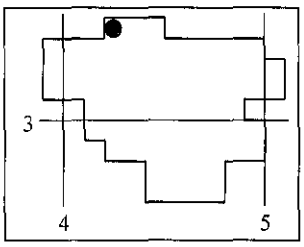
All our records are of plants escaping from gardens or introduced with soil. Naturalized on railway bridge, Forest Row (438.347), 1994, TR & NM; introduced with soil by pond, Pippingford Park (44.30), 1995, PD & RN; spreading on graves, Fairwarp Church (466.268), 1995, TR; Crowborough Training camp, possibly on bare ground near offices (49.29), 1995, RN.

Possibly native on limestones in the south-west of Britain, but not native in Sussex where it mainly occurs on walls near the sea (Hall 1980). Increasing in England (Rich & Woodruff 1996). Native in northern and western Europe and North Africa.

SAXIFRAGACEAE

[***Darmera peltata*. Indian rhubarb.**
Planted in bog garden at Chelwood Vachery (430.295) but not yet naturalized though it could spread down the stream and naturalize in damp woodland, its usual habitat in North America.]

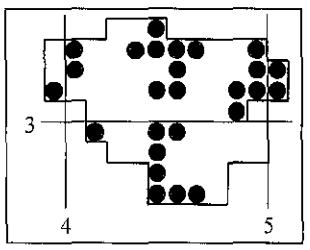
***Tellima grandiflora*. Fringe-cups.**



Recorded spreading down verge at Highgate (426.341), and spreading down stream at Kidbrooke (420.345), 1995, TR.

It is now occasionally established in Britain, especially down rivers, and is increasing in England (Rich & Woodruff 1996). It is native in western North America.

***Chrysosplenium oppositifolium*. Opposite-leaved golden-saxifrage.**



Common on the Forest (Hall 1980).

We have recorded it scattered along the larger rivers, and occasionally in flushes in the woodlands. It is one of the earliest species to flower from February onwards, and is easily overlooked later in the year. Planted in marsh west of Fairwarp Village Hall (466.264) by B. Hoath in the mid-1980s, and spreading to form a large patch.

It occurs in both acidic and basic flushes in Sussex, but its relative *C. alternifolium* only tends to occur in flushes from the Bargate Beds which are rich in minerals other than calcium (FR, pers. comm. 1992). It is common in the Weald, though absent from the Downs (Hall 1980), and is widespread in Britain and western Europe east to Poland.

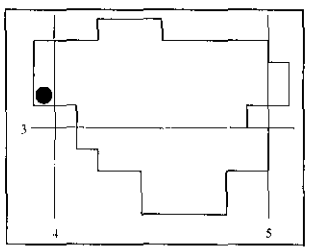
ROSACEAE

***Spiraea*.**
Fairwarp, E. D. Morgan (Wolley-Dod 1937). Tetrads 42N and 53W (Hall 1980).

Old records refer to *S. "salicifolia"* which was broadly interpreted to include *S. alba* and hybrids, so which plants occurred is unknown. Even now, the identity of some bushes is uncertain; they have been named using the accounts in Rich & Rich (1988) and Stace (1991) but each bush seems to key out to a different name.

They are all untidy, invasive plants unsuitable for small gardens, and consequently get thrown out regularly.

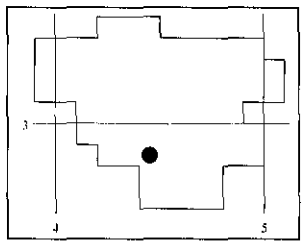
***Spiraea* × *pseudosalicifolia (S. douglasii* × *salicifolia)*. Confused bridewort.**



Twyford, near lake (395.312), 1995, DB.

Probably the most commonly naturalized *Spiraea* in Britain. It originated in cultivation.

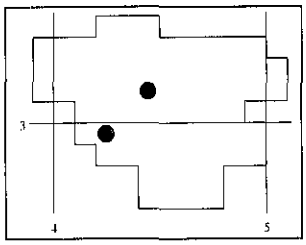
***Spiraea douglasii*. Steeplebush.**



This species, or possibly one of its hybrids, near Nutley (44.28), 1994, SBRS.

It is widely grown in gardens, and is native in North America.

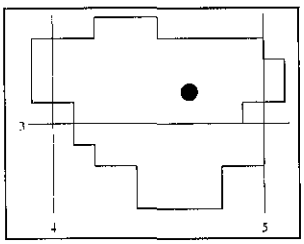
Spiraea canescens. **Himalayan spiraea.**



Plants with white flowers, flat-topped inflorescences and bluish leaves thought to be this species are naturalized at Maskett's Wood (42.28) and Pippingford (44.31).

It is apparently rarely naturalized in Britain, and as the name implies is native in the Himalaya.

Filipendula vulgaris. **Dropwort.**

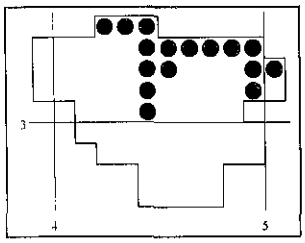


A few plants on the road verge near Gills Lap (469.319), NM & CM, 1993. The discovery of this species was surprising, but it appears to be one of a number of calcicoles growing on verges on the Forest possibly introduced with chalk used to make the road (see *Iberis*).

It is predominantly a plant of chalk and limestone in south-east Britain, but will also grow on calcareous clays and in river meadows. It is surprisingly common on the chalk in East Sussex compared to West Sussex, and there are occasional records in the Weald (Hall 1980). It is fairly widespread in dry grassland in Europe, where it can also be found in open woodland.

It also occurs in Asia and the North African mountains.

Filipendula ulmaria. **Meadowsweet, Sweet hay.**

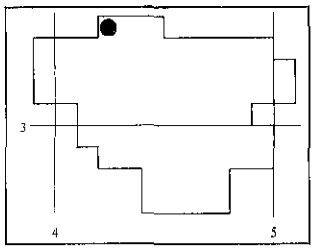


Common on the Forest (Hall 1980).

Our records show an interesting restriction to the north side of the Forest where damp ground and marshes are associated with the main stream valleys, and possibly the more base-rich soils. It occurs on river banks and lightly-grazed, damp pastures, but is virtually absent from the small fenny areas in the alder woodlands possibly because it is sensitive to ferrous iron toxicity (Grime *et al.* 1988).

In Sussex it is widespread but is largely absent from the dry chalk and the Ashdown Sands, confirming our pattern on a broader scale. It is nearly ubiquitous in Britain and widespread in Europe and temperate Asia.

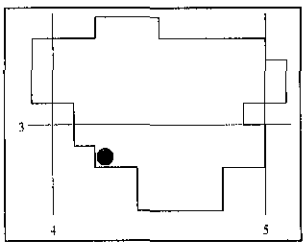
Kerria japonica. **Kerria.**



One plant in hedge opposite houses, Priory Road (421.348), 1995, TR.

A garden plant occasionally established in Britain, probably from material dumped from gardens. It is native in China.

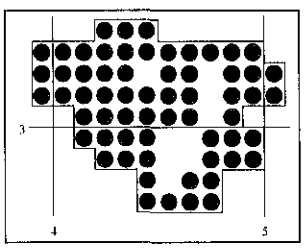
Rubus odoratus. **Purple-flowered raspberry.**



Planted and spreading in Maskett's Wood (428.285), 1994, TR.

A native of eastern North America, cultivated in gardens and rarely naturalized in Britain and Europe.

Rubus idaeus. **Raspberry.**



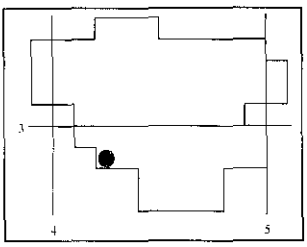
Chelwood Common, N. J. Treutler, 1886, and described as common on the Forests by E. Jenner (Arnold 1887). Common on the Forest (Hall 1980).

We have recorded it widely around the Forest on verges, woodland edges and hedges. It is also a nitrophile and tends to occur on the richer soils, so it is rare on the parts of the Forest with poor heathland soils. It is probably wild in the damper woods, but plants elsewhere may be of garden origin. It was also grown for the fruit crop at the former Wych Cross fruit farm, and is frequent by the fence along the edge of Broadstone Warren where it was presumably spread by birds. Wild plants are fairly uniform in Britain and differ from cultivated plants in having mainly hairy stems, large dense prickles, and smaller, darker fruits which are mostly

insipid in flavour (Haskell 1960).

In Sussex it is rarer on the heavy clay soils. Widespread and increasing in England (Rich & Woodruff 1996), and widespread in Europe and Asia.

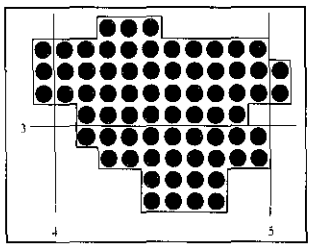
***Rubus spectabilis*. Salmonberry.**



Three separate clumps on grassy area west of Stonemead (429.289), 1994, PH *et al.*

This species is potentially invasive. First introduced to Britain in 1827, grown in gardens and planted as pheasant food, it is now locally naturalized. Most of the spread currently appears to be vegetative, and fruit production is low compared to its native sites in North America. It appears to be more at home in northern Scotland.

***Rubus fruticosus*. Bramble, Blackberry.**



Brambles tend to be abundant on acidic soils in well-lit places, and we have recorded them in every square on the Forest.

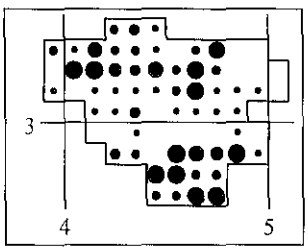
Many brambles produce berries asexually, creating many local forms differing in many small characters such as leaf shape, hairiness, prickles, etc.; there are over 400 of these 'microspecies' in Britain. The heaths and commons of south-east England are very rich in species, and Ashdown Forest is the centre of a regional endemic complex. Nineteen of the species recorded are endemic to Britain, and many more to Europe.

This account follows *Brambles of the British Isles* (Edees & Newton 1988). Four batologists (from *batos* = berry) have identified our microspecies. In 1994, Dave Earl taught TR a few basic species, while Alan Newton and Alec Bull independently recorded five 1-km squares on the north side of the Forest and two on the south side. In 1995, Rob Randall joined us for a day recording on the south side of the Forest. Other records for TQ/4.2 and TQ/4.3 have been taken from the maps in Edees & Newton (1988) (most of the records in Hall 1980 were based on the same information), and from the report of a *Rubus* meeting at Newbridge in 1969 (Philp 1970), updated with help from Alan Newton. There are some unnamed species present and a considerable amount of work remains to be done.

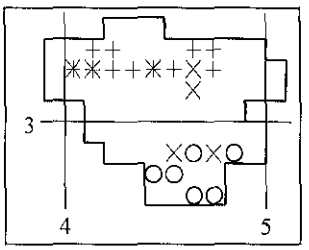
Blackberries have been collected locally for many years (e.g. 25 kg by one family alone in 1985; *AFN* 8:20). Arthur (1989) records that a Sussex folk remedy for boils was to crawl under a bramble which had grown into the soil at both ends. Anyone trying it may need another of his remedies for extracting thorns from fingers; draw the thorn out using one of the bramble leaves moistened with a blackberry as a plaster for an hour or two. 'Brambletye' is a local name at Forest Row, originally 'Branbertie' in the Doomsday Book.

Not surprisingly, the records we have are strongly related to where the expert batologists have recorded.

Number of microspecies
(small dots few species, large dots many species)



Recorders
(symbols are X = AN & AB, + = DE, O = RR)



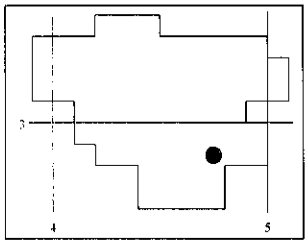
The non-specialist can skip most of the next few pages unless they want to know which blackberries they are likely to be eating, but have a look at *Rubus newbridgensis*, Ashdown Forest's very own bramble.

Section *Rubus*. Subsection *Rubus (R. suberectus)*.
The records for *R. suberectus* from Ashdown (Cooper 1835) and Ashdown Forest, W. Borrer (Arnold 1887) are referred to this Subsection but not to a microspecies.

***Rubus arrheniiformis*.**
Wych Cross, 1951, W. Watson (**CGE** - the TQ/4.3 record in Hall 1980; Edees & Newton 1988).

Widespread but very localised in England and Wales on heaths and heathy woods. Long thought to be a British endemic, AN has recently confirmed it from Holland and Belgium.

Rubus bertramii (R. opacus).



East of Camp Hill (47.28), 1994, AN & AB.

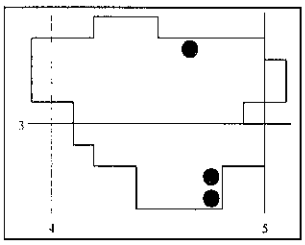
Widespread in damp woods and heath margins in north-western Europe. Perhaps one of the best tasting blackberries (Earl 1994).

Rubus fissus (R. rogersii).

New Bridge near Posingford Wood, 1933, W. C. Barton & H. J. Riddelsdell (Wolley-Dod 1937). Newbridge, 1969, B. A. Miles (Philp 1970). Newbridge, 1974, AN.

Widespread but very localised in Britain on heaths and in heathy woods and apparently endemic.

Rubus nessensis.

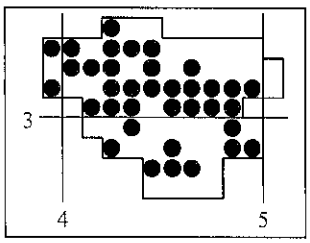


Posingford Wood, Hartfield, 1936, W. C. Barton & H. J. Riddelsdell (**BM**).

Path to Pooh Bridge (468.335), 1994, DE. Furnace Wood (473.264), 1995, RR & PH; above lake at Oldlands Hall, TR *et al.* 1995, and it seems to be well established in this valley and further down (e.g. Rock Wood, 1907, T. Hilton, **BM**).

First described from Loch Ness (hence the name), and widespread in Europe in damp woods and by streams.

Rubus plicatus.

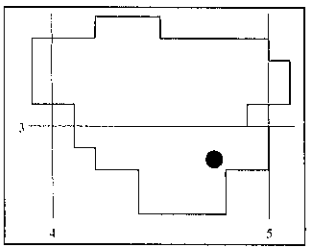


Ashdown Forest (Cooper 1835). Ashdown Forest, W. Borrer (Arnold 1887). Forest Row, A. H. Wolley-Dod and E. G. Gilbert (Wolley-Dod 1937). TQ/4.3 (Hall 1980; Edees & Newton 1988).

Goat car park (403.326), Warren car park (416.320), Townsend car park (445.328), 1994, DE. Near Coldharbour (40.32), Hindleap Warren (41.32), Gills Lap (46.31), roadsides near Sunting's, Newbridge (46.32), 1994, AN & AB. Nutley (44.27, 45.27), near Poundgate car park (48.28), 1995, RR & PH. The map has many more records which were noted in the field once we had learnt how to identify this species. It is probably the commonest upright bramble with white flowers, in June, on open heathland.

Widespread on heaths and moors in central and western Europe, preferring dry sandy soils.

***Rubus scissus (R. fissus sensu* Focke).**



East of Camp Hill (47.28), 1994, AN & AB.

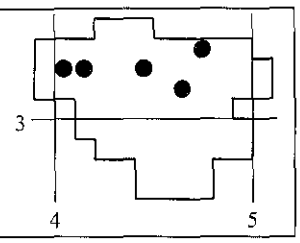
Quite common north of a line from the Wash to the Severn, but very localised in the lowlands. Widespread on heaths and moors in north-western Europe.

Rubus sulcatus.

Near Wych Cross, 1904, H. C. Waddell (Wolley-Dod 1937). A possible record but requiring confirmation. It is a very local species usually found in only small quantity.

Section *Rubus*. Subsection *Hiemales*.
Series *Sylvatici*.

Rubus chloophyllus (R. rhodanthus, R. rhombifolius).

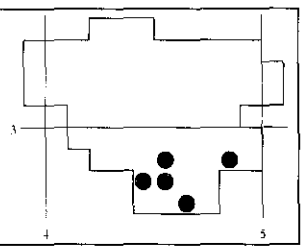


Ashdown Forest, 1899, T. Hilton (**BM**). Newbridge, 1969, B. A. Miles (Philp 1970). Open woods and heaths, particularly in Ashdown Forest (Edees & Newton 1988). The record for ***R. holerythrus*** **from** near Wych Cross, A. H. Wolley-Dod (Wolley-Dod 1937) probably belongs here.

Common in woods near Pooh car park (472.332), 1994, DE, and possibly this species on heath opposite Townsend car park (445.328), 1994, DE. Near Coldharbour (40.32), Hindleap Warren (41.32), Coleman's Hatch (44.32), Gills Lap (46.31), 1994, AN & AB.

A characteristic species of Ashdown Forest in open woods and heaths. It also occurs in Kent and western France.

Rubus imbricatus.

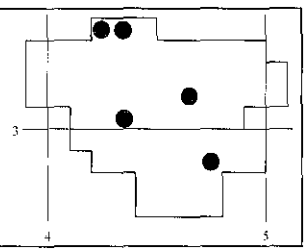


TQ/4.3 (Hall 1980; Edees & Newton 1988).

Nutley (44.27, 45.27, 45.28), Fairwarp (46.26), near Poundgate car park (481.284), 1995, RR & PH.

Locally frequent in southern Britain in well-defined populations on acidic soils on hedgebanks, heaths and borders of woods. Also known in France and Germany.

****Rubus laciniatus.***



There are a number of scattered records from around the Forest for this introduced species which has probably been spread from gardens by birds. Instantly distinguished from the other brambles, even by the non-expert, by the finely divided leaflets.

Widespread in north-western Europe.

[Rubus lentiginosus.

Newbridge, E. G. Gilbert (Wolley-Dod 1937). A very doubtful record as the main area of distribution is in North Wales, but there are isolated records for the Hampshire-Berkshire border; it may refer to *R. brevistaminosus* which occurs at Newbridge.]

Rubus lindleianus.

Ashdown Forest, rather scarce, H. J. Riddelsdell (Wolley-Dod 1937); Wych Cross, 1906, C. R. Billups (**OXF**, the TQ/4.3 record in Hall 1980; Edees & Newton 1988).

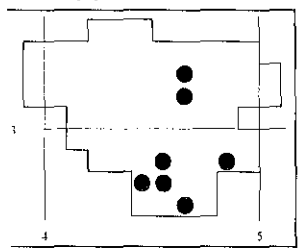
Widespread in north-western Europe often on hedgebanks. The fruits of this species are rather small, seedy and sour (Earl 1994).

Rubus platyacanthus (R. carpinifolius).

Posingford Wood, W. C. Barton and H. J. Riddelsdell; Ashdown Forest, scarce, H. J. Riddelsdell (Wolley-Dod 1937). Coleman's Hatch, W. C. Barton. TQ/4.3 (Hall 1980; Edees & Newton 1988).

Widespread in north-western Europe on heaths, etc.

Rubus pyramidalis.

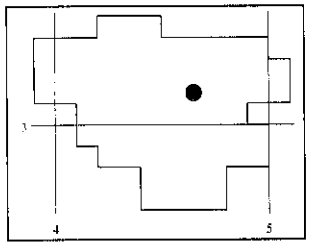


Roadside between Newbridge and Chuck Hatch, 1934, W. C. Barton & H. J. Riddelsdell (**BM**).

Stonehill (45.28), Gills Lap (46.31), roadsides near Sunting's, Newbridge (46.32), 1994, AN & AB. Nutley (44.27, 45.27, 45.28), Fairwarp (46.26), near Poundgate car park (481.284), 1995, RR & PH.

Widespread in north-western Europe.

Rubus sciocharis.

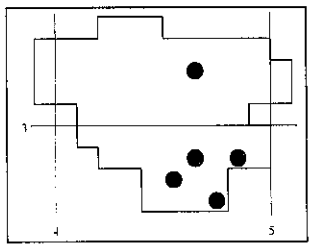


Gills Lap (46.31), 1994, AN & AB, the first record for East Sussex.

Widespread in north-western Europe on wood borders and hedgebanks but rather localised in Britain and possibly still colonising from the continent (RR, pers. comm. 1996).

Series *Rhamnifolii.*

Rubus cardiophyllus (R. rhamnifolius).

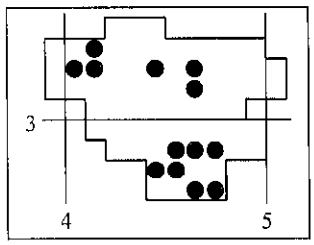


Posingford Wood, E. G. Gilbert; fairly common on Ashdown Forest, H. J. Riddelsdell (Wolley-Dod 1937). Newbridge, 1969, B. A. Miles (Philp 1970). TQ/4.3 (Hall 1980; Edees & Newton 1988).

Roadsides near Sunting's, Newbridge (46.32), 1994, AN & AB. Nutley (45.27), near Ellison's Pond (46.28), Fairwarp Farm (47.26), Poundgate car park (48.28), 1995, RR & PH.

Local in north-west Europe on edges of heaths, woods, and on hedgebanks but widespread and common in most of lowland Britain.

Rubus cissburiensis.

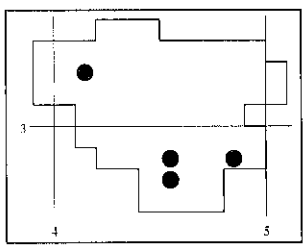


Near Newbridge, 1934, W. C. Barton & H. J. Riddelsdell (**BM**). TQ/4.3 (Hall 1980; Edees & Newton 1988).

Priory Road near Kidbrooke Wood (412.338), Goat car park (403.326), Warren car park (416.320), Townsend car park (445.328), 1994, DE. Near Coldharbour (40.32), Hindleap Warren (41.32), Coleman's Hatch (44.32), Stonehill (45.28), Gills Lap (46.31), roadsides near Sunting's, Newbridge (46.32), east of Camp Hill (47.28), 1994, AN & AB. Nutley (44.27, 45.27, 45.28), near Ellison's Pond (46.28), Fairwarp (46.26, 47.26), Toll Lane (461.263), near Poundgate car park (481.284), 1995, RR & PH.

Described from Cissbury in Sussex, and a regional endemic of heaths and wood borders especially near London. Widespread, often abundant in south-east England.

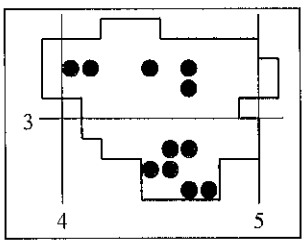
Rubus dumnoniensis.



Hindleap Warren (41.32), Stonehill (45.28), 1994, AN & AB (Edees & Newton 1988). Nutley (45.27), near Poundgate car park (481.284), 1995, RR & PH.

Widespread in Britain, but a predominantly western species. Recently found in France.

Rubus polyanthemus.

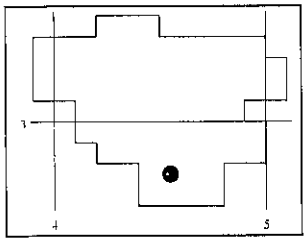


Wych Cross, A. H. Wolley-Dod; Posingford Wood, H. J. Riddelsdell (Wolley-Dod 1937). Marshy ground near Crowborough Warren, 1932, W. C. Barton (**BM**). Crowborough Common, 1933, W. C. Barton & H. J. Riddelsdell (**BM**). TQ/4.3 (Hall 1980; Edees & Newton 1988).

Warren car park (416.320), and Townsend's car park (445.328), 1994, DE. Near Coldharbour (40.32), Hindleap Warren (41.32), Stone Hill (45.28), Gills Lap (46.31), roadsides near Sunting's, Newbridge (46.32), 1994, AN & AB. Nutley (44.27, 45.27), Fairwarp (46.26, 47.26), near Ellison's Pond (46.28), 1995, RR & PH.

Widespread in Britain in hedges, wood edges, quarries, etc. and in north-western Europe.

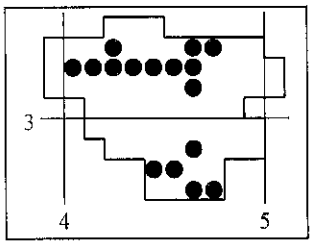
Rubus prolongatus.



Nutley (45.27), 1995, RR & PH, known in the area (Edees & Newton 1988) and seen at Chailey Common in 1994, AN and BSBI, and Tunbridge Wells, 1995, RR.

Woods, heaths and hedgebanks, widespread in south-western Britain and also found in north-western France.

Rubus subinermoides (R. pubescens* var. *subinermis).



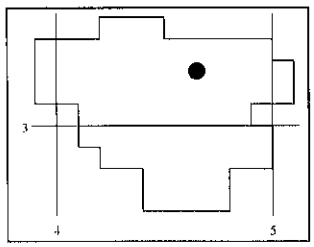
One of the commonest *Rubi* on Ashdown Forest, H. J. Riddelsdell; near Wych Cross, T. Hilton (Wolley-Dod 1937). Newbridge, 1969, B. A. Miles (Philp 1970). TQ/4.3 (Hall 1980; Edees & Newton 1988).

Woods near Priory Road (42.33), Goat car park (403.326), Warren car park (416.320), opposite Wych Cross Nurseries (421.321), Ashdown Forest Visitor Centre (43.32), Townsend's car park (445.328), Newbridge (456.325), and Pooh car park to Pooh Bridge (46.33, 47.33), 1994, DE. Near Coldharbour (40.32), Hindleap Warren (41.32), Coleman's Hatch (44.32), Gills Lap (46.31), roadsides near Sunting's, Newbridge (46.32), 1994, AN & AB. Nutley (44.27, 45.27), Fairwarp (46.26, 47.26), near Ellison's Pond (46.28), 1995, RR & PH.

Often abundant in Sussex, and common and widespread in southern England, yet endemic to the British Isles.

Series *Sprengeliani.*

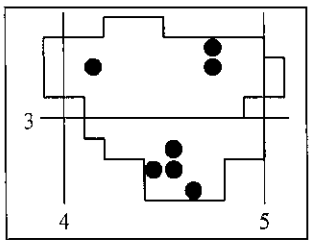
Rubus brevistaminosus.



Roadsides near Sunting's, Newbridge (46.32), 1994, AN & AB (Edees & Newton 1988).

A local endemic species apparently confined to the Weald and North Downs. There are several colonies in the Hartfield area.

Rubus sprengelii.



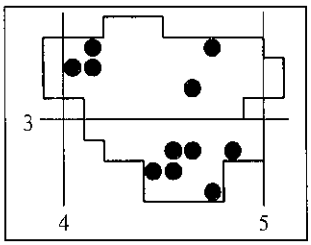
TQ/4.3 (Hall 1980; Edees & Newton 1988).

Warren car park (416.320), Piglet's car park (470.320), Pooh car park (472.332), 1994, DE. Hindleap Warren (41.32), Stonehill (45.28), 1994, AN & AB. Nutley (44.27, 45.27, 45.28), Fairwarp (46.26), 1995, RR & PH.

This dainty pink-flowered bramble may be quite widespread in the Forest. Widespread in central and northern Europe, especially in oak-birch woods on sandy and gravelly soils.

Series *Discolores.*

Rubus armipotens (R. godronii, R. pseudobifrons).

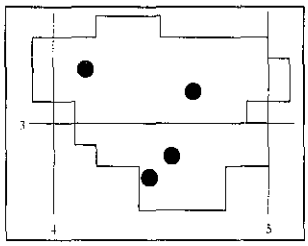


Near Wych Cross, W. C. Barton & H. J. Riddelsdell (Wolley-Dod 1937). Newbridge, 1969, B. A. Miles (Philp 1970). TQ/4.3 (Hall 1980; Edees & Newton 1988).

Priory Road near Kidbrooke Wood (412.338), Goat car park (403.326), and path to Pooh Bridge (472.332), 1994, DE. Near Coldharbour (40.32), Hindleap Warren (41.32), Gills Lap (46.31), 1994, AN & AB. Nutley (44.27, 45.27, 45.28), near Ellison's Pond (46.28), Fairwarp Farm (47.26), near Poundgate car park (481.284), 1995, RR & PH.

An endemic species of heaths, wood margins and hedgebanks, and particularly common in south-east England.

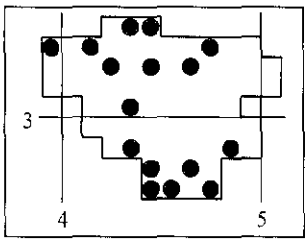
Rubus procerus (R. armeniacus). **Himalayan Giant.**



Hindleap Warren (41.32), Stonehill (45.28), Gills Lap (46.31), 1994, AN & AB. Nutley (44.27), 1995, RR & PH.

This is the cultivated blackberry which is increasingly escaping from cultivation in Britain. Despite the English name it probably originated from Germany. The berries may vary from sweet to sour on the same panicle, though with a few ounces of sugar they are ideal for jam or pies (Earl 1994).

Rubus ulmifolius (R. rusticanus).



Newbridge, 1969, B. A. Miles (Philp 1970). TQ/4.3 (Hall 1980; Edees & Newton 1988).

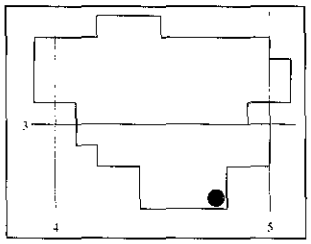
Path to Pooh Sticks Bridge (472.332), near Townsend car park (445.328), 1994, DE. Roadsides near Sunting's, Newbridge (46.32), AN & AB, 1994. Nutley (44.27), Fairwarp Farm (47.26), 1995, RR & PH.

Perhaps one of the commonest and most widespread brambles in Britain, from sea cliffs in the Channel Islands to hedges in central England, and north to Scotland, though becoming more restricted to south-facing banks near the coast in the north.

It has also been introduced throughout the world (not for its fruits which are small and sour) and is often a pest; for instance, it has spread dramatically on Robinson Crusoe's Islands off the coast of Chile and is ousting the native flora which contains 41% endemics (*Plant Talk* 2: 19-21).

Series *Vestiti.*

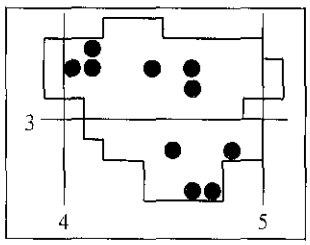
Rubus adscitus.



East of Fairwarp Farm on path edge (473.266), 1995, RR & PH, the first record for East Sussex. It has long pointed sepals and floriferous zigzag panicles which make it look somewhat more distinctive than many brambles.

It is widespread in southern Britain, and also occurs in France.

Rubus leucostachys.



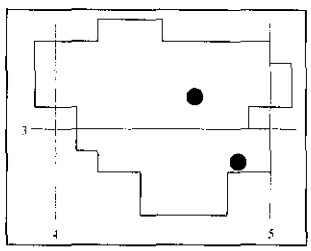
Newbridge, 1969, B. A. Miles (Philp 1970). TQ/4.3 (Hall 1980; Edees & Newton 1988).

Woods near Priory Road (412.338), and Townsend's car park (445.328), 1994, DE. Near Coldharbour (40.32), Hindleap Warren (41.32), Coleman's Hatch (44.32), Stonehill (45.28), Gills Lap (46.31), roadsides near Sunting's, Newbridge (46.32), 1994, AN & AB. Toll Lane (461.263), Fairwarp (46.26, 47.26), near Poundgate car park (481.284), 1995, RR & PH.

'Var. *angustata*' was also recorded at Coleman's Hatch (44.32) and Stonehill (45.28), 1994, AN & AB.

A regional endemic species in south-east England.

Rubus surrejanus.

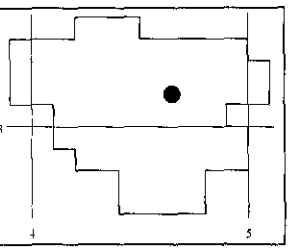


Probably Ashdown Forest, C. H. Waddell? (Wolley-Dod 1937). TQ/4.3 (Hall 1980; Edees & Newton 1988). The record for *R. lasiostachys* from Newbridge, 1969, B. A. Miles (Philp 1970) refers to this species.

Specimens collected at Warren car park (416.320), 1994, DE, may be this species. Gills Lap (46.31), 1994, AN & AB. South of Poundgate car park (482.284), 1995, RR & PH.

Hedgebanks, borders of woods and heaths, widespread and endemic in southern England.

ubus vestitus.



Newbridge, 1969, B. A. Miles (Philp 1970). TQ/4.3 (Hall 1980; Edees & Newton 1988).

Gills Lap (46.31), 1994, AN & AB, and scarce in the area.

Woods, wood margins and hedgebanks, often on somewhat calcareous soils. Widespread in western and central Europe.

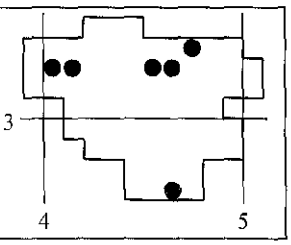
eries *Mucronati.*

Rubus acutifrons.

ewbridge, W. C. Barton and H. J. Riddelsdell (Wolley-Dod 1937). This record is doubtful as it is a regional endemic pecies of the Welsh borders; the record probably refers to *R. decussatus*.]

eries *Micantes.*

***ubus decussatus (R. hirtus* var. *rubiginosus* in part, Wolley-Dod 1937).**

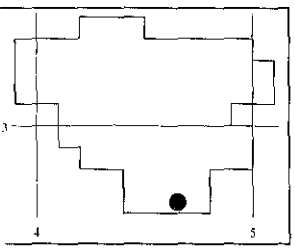


Newbridge, 1969, B. A. Miles (Philp 1970). TQ/4.3 (Hall 1980; Edees & Newton 1988).

Goat car park (403.326), Warren car park (416.320), Newbridge (456.325), footpath to Pooh car park (472.332), 1994, DE. Near Coldharbour (40.32), Hindleap Warren (41.32), roadsides near Sunting's, Newbridge (46.32), 1994, AN & AB. Fairwarp Farm (47.26), Toll Lane (461.263), 1995, RR & PH.

Difficult to distinguish from *R. largificus*, but plants referable to this aggregate are quite common. A regional endemic species of south-east England.

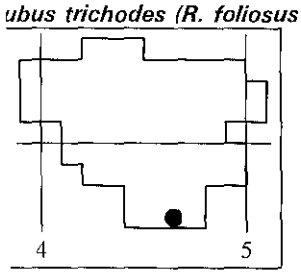
Rubus hastiformis (R. thyrsiger).



Toll Lane woodland (461.263), 1995, RR & TR.

A regional endemic of the British Isles of wood margins and heaths almost confined to areas near the coast in south-west England, Wales and southern Ireland, so ours is an especially interesting record. It was also found by H. J. Riddelsdell in the Brighton area.

***ubus trichodes (R. foliosus* auct.).**



Recorded from Newbridge, 1969, B. A. Miles (Philp 1970).

A plant collected at Toll Lane (460.263), 1995, RR has been confirmed by AN, as has another from Lake Wood, Uckfield. It is a regional endemic of woods and wood margins in south-east Britain.

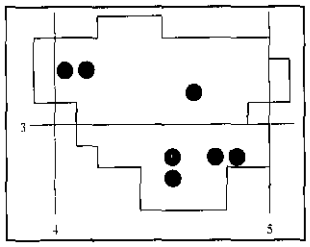
ibus wedgwoodiae.

ych Cross, W. C. Barton (Wolley-Dod 1937); specimen not seen by AN and not found in the area recently.

This species is an endemic and occurs on heaths in West Sussex and Surrey.

Series *Anisacanthi.*

Rubus dentatifolius.



TQ/4.3 (Hall 1980; Edees & Newton 1988).

Near Coldharbour (40.32), Hindleap Warren (41.32), Stonehill (45.28), Gills Lap (46.31 east of Camp Hill (47.28), 1994, AN & AB. Nutley (45.28), near Poundgate car park (48.28 1995, RR & PH.

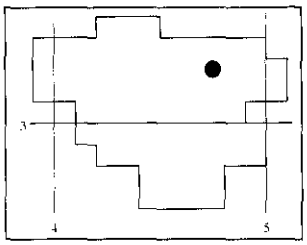
Widespread across southern England and Wales, Ireland and western France, predominantly western species.

[***Rubus infestus.***

Near Wych Cross, C. H. Waddell (Wolley-Dod 1937). This record is doubtful because this species is known to b widespread in the north, with very few records south of the Midlands. Plants at Warren car park (416.320) similar to thi species but not conspecific were seen in 1994, DE.]

Series *Radulae.*

Rubus bloxamii.

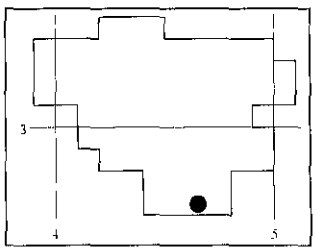


Near Wych Cross, T. Hilton (Wolley-Dod 1937). TQ/4.3 (Edees & Newton 1988).

Under trees at Piglet's car park (470.320), 1994, DE.

Widespread in central and southern England on wood borders, heaths and hedgebanks and extending only to the Channel Islands and Normandy.

Rubus cantianus.

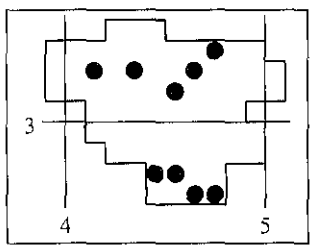


Newbridge, W. C. Barton, 1932 (**BM**, det D. E. Allen).

Toll Lane woodland (461.263), 1995, RR & TR.

A regional endemic species of heaths, hedgebanks and edges of woods in south-eas England.

Rubus flexuosus.

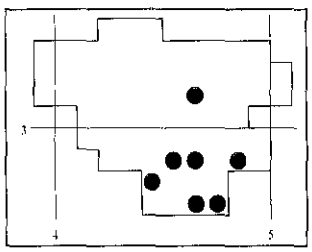


TQ/4.3 (Hall 1980; Edees & Newton 1988).

Ashdown Forest Visitor Centre (43.32), and plants with very flexuose stems occur in th woods west of Pooh car park (472.332) but have predominantly trifoliate leaves on th panicle, so they may be of hybrid origin as commented on in Edees & Newton (1988), 199 DE. Hindleap Warren (41.32), roadsides near Sunting's, Newbridge (46.32), 1994, AN & A Nutley (44.27, 45.27), Toll Lane (461.263), Fairwarp (46.26, 47.26), 1995, RR & PH.

Widespread in Europe.

Rubus insectifolius (R. nuticeps; R. fuscus* var. *nutans).

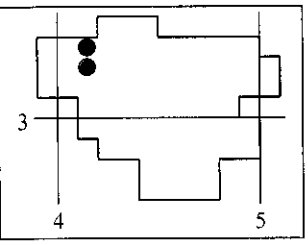


Near Ashdown Park, Newbridge, W. C. Barton and H. J. Riddelsdell (Wolley-Dod 1937); s present in 1994, DE. TQ/4.3 (Hall 1980; Edees & Newton 1988).

Stonehill (45.28), Gills Lap (46.31), 1994, AN & AB. Nutley (44.27, 45.28), Toll La (461.263), near Ellison's Pond (46.28), Fairwarp (46.26, 47.26), near Poundgate car pa (481.284), 1995, RR & PH. It tends to get a felt-like mould/disease on the leaves which th spreads to other species.

Widespread in western Europe.

Rubus largificus.

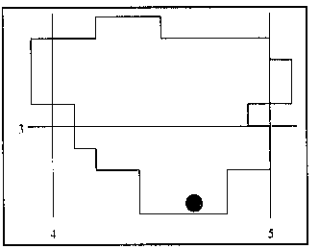


Newbridge, 1969, B. A. Miles (Philp 1970). TQ/4.3 (Hall 1980; Edees & Newton 1988).

Hindleap Warren (41.32), 1994, AN & AB; woods near Priory Road (412.338), 1994, DE.

A regional endemic of wood borders, heaths and hedgebanks which could easily be confused with *R. decussatus*. The large fruits in autumn may make good crumble (Earl 1994)!

Rubus rudis.



North of Wych Cross, W. C. Barton (Wolley-Dod 1937; unconfirmed).

Fairwarp (46.26), 1995, RR & PH.

Widespread in north-western and central Europe.

Series *Hystrices.*

***Rubus murrayi (R. hystrix* var. *adornatus sensu* Wolley-Dod 1937).**

Newbridge, A. H. Wolley-Dod (Wolley-Dod 1937). Newbridge, 1969, B. A. Miles (Philp 1970). Newbridge, 1974, AN (Hall 1980; Edees & Newton 1988).

Plants which may be this species occur on the path to Pooh car park (472.332), 1994, DE.

An endemic species, widespread, but only locally common in Warwickshire and near London.

***Rubus newbridgensis*. Ashdown Forest bramble.**

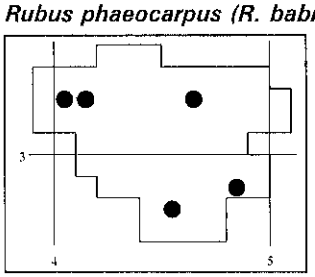
Wych Cross to Nutley Road, 1931, W. C. Barton (**BM**). Newbridge, 1934, W. C. Barton (**BM**). Dry ground by the road bridge, Newbridge, and roadside Newbridge to Chuck Hatch, 1933, W. C. Barton & H. J. Riddelsdell (**BM**). High Beeches, Ashdown Park, 1933, W. C. Barton & H. J. Riddelsdell (**BM**). Newbridge, 1969, B. A. Miles (Philp 1970). Newbridge, 1974, AN (Hall 1980; Edees & Newton 1988).

Our very own bramble but with only one very tentative record from near High Beeches, 1995, TR. When AN and AB visited the Newbridge area in 1994 they did not explore it extensively as much of the wood has grown up making the area unattractive for looking for brambles (refound 1996 by RR & PH near the water splash). It has certainly decreased in the Worth and Rowfant district.

Described as new to science by Barton & Riddelsdell (1936) from the type specimen collected at Newbridge in 1934, and reported from "East Sussex, in many places near Worth and eastwards to the Hartfield-Maresfield Road ... uniform and constant in characters, easily distinguished by the combination of a very fully and variously armed stem, neat concave leaves and leaflets, and a sturdy cylindrical panicle with hairy rachis densely armed and glandular. The plant is of a rather greyish-green colour in the open; the intermediate and basal leaflets are large in proportion to the terminal leaflet; the armature is remarkably uniform on stem rachis and petioles; the stem-prickles themselves often armed with hairs, glands and pricklets".

A regional endemic of southern England in woods, wood margins and hedgebanks.

Rubus phaeocarpus (R. babingtonii).



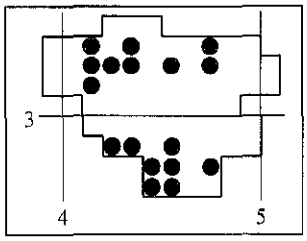
Newbridge, W. C. Barton and H. J. Riddelsdell (the TQ/4.3 (Hall 1980; Edees & Newton 1988).

Warren car park (416.320), 1994, DE. Near Coldharbour (40.32), Hindleap Warren (41.32), roadsides near Sunting's, Newbridge (46.32), 1994, AN & AB. Nutley (45.27), near Poundgate car park (481.284), 1995, RR & PH.

Heaths and wood borders, widespread in south-east England, and also found in northern France.

Subgenus *Rubus*. Section *Corylifolii*.

***Rubus britannicus*.**



Road to Hindleap Warren Activity Centre (415.320), pH 5.5, opposite Wych Cross Nurseries (421.321), Ashdown Forest Visitor Centre (43.32), Newbridge (456.325) and path to Pooh Bridge (472.332), 1994, DE - this species can be used for playing Pooh sticks when no twigs can be found. Hindleap Warren (41.32), Stonehill (45.28), 1994, AN & AB. Nutley (44.27, 45.27), 1995, RR & PH.

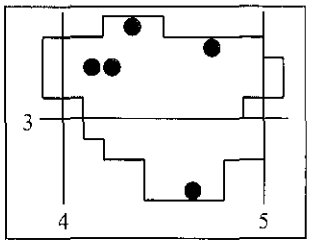
This species has quite distinct large round leaflets, and TR has added the extra records. It is a regional endemic of woods and their borders in south-east England.

***Rubus conjungens*.**

Marsh Green near Hartfield, 1942, W. C. Barton (**BM**).

An endemic species widespread in southern Britain on hedgerows and banks, and very local elsewhere.

***Rubus nemorosus (R. balfourianus)*.**



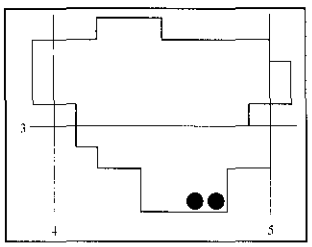
Newbridge, 1969, B. A. Miles (Philp 1970). TQ/4.3 (Hall 1980; Edees & Newton 1988).

On woodland edge at the top of the path to Pooh Bridge (472.331), opposite Wych Cross Nurseries (421.321), and opposite Wilkins Garage, Forest Row (437.347), 1994, DE. Hindleap Warren (41.32), 1994, AN & AB. Toll Lane (461.263), 1995, RR & PH.

Widespread in south-east Britain but more localised in the north, and in north-western and central Europe.

The fruits of this species are a good size and flavour, often better than those of *R. procerus* (Earl 1994).

***Rubus tuberculatus*.**



Clays at Toll Lane (461.263), and near Fairwarp Farm (47.26), 1995, RR & PH.

Widespread in hedges, on wood borders, waste ground and railways, etc., a weedy and aggressive bramble. It predominantly occurs in the west but is spreading eastwards (RR, pers. comm. 1996). It also occurs in north-west Germany.

In addition there are three taxa whose taxonomy remains to be clarified:

Rubus orbifolius sensu W. C. R. Watson. Near Coldharbour (40.32), Hindleap Warren (41.32), roadsides near Sunting's, Newbridge (46.32), 1994, AN & AB. Nutley (44.27), 1995, RR & PH. A local endemic as yet undescribed.

Rubus sprengeliiflorus sensu W. C. R. Watson. Near Coldharbour (40.32), Hindleap Warren (41.32), Coleman's Hatch (44.32), Stonehill (45.28), roadsides near Sunting's, Newbridge (46.32), East of Camp Hill (47.28), 1994, AN & AB. A local endemic as yet undescribed.

R. vulnerificus Lef. ex Genev. Ford's Green, Nutley (447.272) and scrub in Toll Lane (462.263), 1995, RR. These plants were compared against material in the BM from Buckham Hill and several localities in France and may be correct assuming that the name is legitimate.

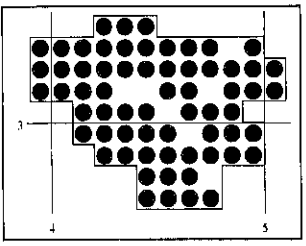
Subgenus *Rubus*. Section *Caesii*.

***Rubus caesius*. Dewberry.**

Tetrads 42N and 42P (Hall 1980).

We have five provisional records all of which require verification (as do Hall's) as it is often over-recorded for members of the *Corylifolii* series. This species is most common on the chalk and calcareous soils in Sussex. It is a widespread calcicole in Europe.

***Potentilla anserina*. Silverweed.**



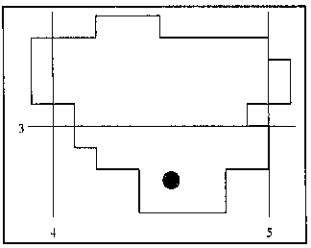
Common on the Forest (Hall 1980).

It is frequent in damper patches on rides and wet grassland, but not on the most acidic soils or in some of the more heavily wooded areas.

The life cycle of this species probably depends on the size of individual plants, and vegetative spread is probably more important for population increase than seeds (Eriksson 1988). Plants pass the winter as a rhizome with the bud at the soil surface, and the leaves develop in the spring. Small rosettes may simply grow all summer. In June and July, some rosettes above a critical size produce flowers. The flowers are insect-pollinated and self-incompatible, but fruit production is commonly limited by availability of pollen. Between July and September the bigger rosettes produce stolons which root and give rise to daughter rosettes, but this uses a lot of resources. A few rosettes both flower and produce stolons. In the autumn the stolons wither leaving isolated daughter plants, and the cycle begins again the next year.

Its prime habitats are shores of lakes, rivers and seas, and it also occurs in man-made habitats such as meadows, roadsides and on waste ground. Ubiquitous in Sussex and Britain, and widespread in Europe except for much of the south and in Asia.

****Potentilla recta*. Sulphur clover.**

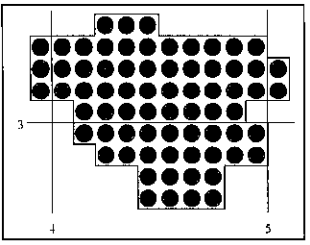


Forest Row, 43M (Hall 1980).

On the path between Nutley and Fairwarp church (45.27), 1995, RN (det. PH), looking very out of place in a bramble bush with *Alchemilla mollis* and *Geranium* × *oxonianum*.

A garden escape originally from Eurasia and North Africa, now widely established in southern and eastern England. It is a very variable species.

***Potentilla erecta* subsp. *erecta*. Tormentil.**

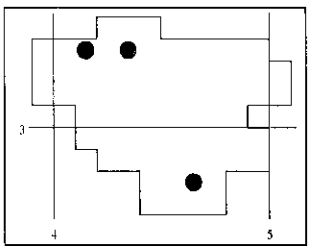


Common on the Forest (Hall 1980).

We have recorded it in every square in grassland and heathland.

Widespread but decreasing in Britain (Rich & Woodruff 1996), and widespread in Britain, Europe and Asia.

Potentilla* × *suberecta (P. erecta* × *anglica).

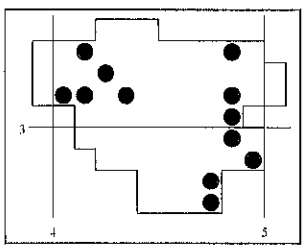


Near Wych Cross, C. E. Salmon (Wolley-Dod 1937).

All three records were made in 1995 by TR whilst specially looking for hybrids, and it genuinely seems to be quite rare on the Forest. These hybrids form few fruits, rarely root at the nodes and have entire or deeply cut stipules but they are not easy to determine (see Harold in Rich & Rich 1988). It seems to be much rarer than *P.* × *mixta*, possibly because one parent, *P. anglica,* is rarer and their distributions correlate well.

It apparently is quite widespread in Britain where the parents occur together.

***Potentilla anglica (P. procumbens).* Trailing tormentil.**

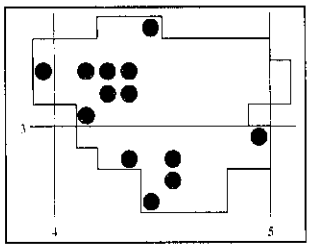


This species is reputedly often confused with *P.* × *mixta* and *P.* × *suberecta* and Hall (1980) suggests it may be frequent in Sussex but the data are too inadequate to be certain.

We had few records until 1995, when plants were specially looked for; only fertile plants were accepted by TR. It occurs on mildly acid soils in unimproved meadows, edges of roads, and tracksides, often in open vegetation.

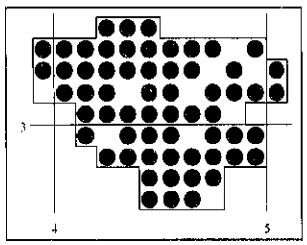
It is probably quite widespread in Britain in the west and in areas with acidic soils, and is mainly western in Europe. It also occurs in Madeira and the Azores.

***Potentilla* × *mixta* (*P. erecta* × *reptans* and *P. anglica* × *reptans*).**



Many sterile plants creeping and rooting at the nodes were recorded under this name, mainly in 1995 after PW had drawn our attention to how frequent they were. It is a composite taxon of two possible origins which are difficult to distinguish morphologically. Plants occur typically on roadsides and hedgebanks, often without either parent but rarely far from them. It is widespread in Britain.

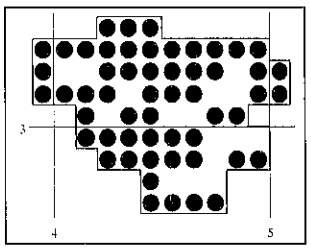
***Potentilla reptans*. Creeping cinquefoil, Five fingers.**



Patches of this creeping plant are typical of roadsides, often in slightly more enriched sites than *P. erecta*. It can also dominate in grassland which is heavily grazed by rabbits, as they do not seem to eat it.

Virtually ubiquitous in Sussex (Hall 1980) and in Europe, though rarer in the north; the Middle East, Himalaya and North Africa.

***Potentilla sterilis*. Barren strawberry.**



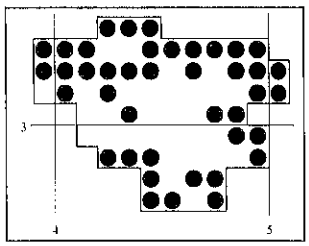
Common on the Forest (Hall 1980).

The most typical sites for this evergreen species are on hedgebanks, in sunken lanes and on woodland banks where it does not get covered in leaf litter. Large populations along the banks of Priory Road (412.338) and opposite Pooh car park (472.331) were mostly scraped off during over-zealous ditching works in spring 1995. It is often regarded as an ancient woodland indicator species but occurs widely in our secondary woodlands.

Common in the Weald and in Britain on moist, base-rich soils of intermediate pH. It is absent from water-logged and drought-prone sites (Grime *et al.* 1988).

It is an endemic, predominantly western, species in Europe. It becomes rare eastwards and in the Czech Republic in 1993, JK and TR had to pull up *Convallaria majalis* and *Polygonatum odoratum* to prevent it being shaded out in one of its two sites (Rich 1996).

***Fragaria vesca*. Wild strawberry.**



Common around the Forest (Hall 1980).

Our map gives more detail also showing it to occur mainly around the edges. It often occurs on road banks with *Potentilla sterilis* but it may be less common because it grows best on calcareous soils of which we have few.

The delicious little strawberries are eaten by birds, slugs and hungry botanists. It forms patches and spreads up to 1 metre at a time by stolons which appear after flowering in the late summer; the stolons root when they contact moist soils and decay during the winter to leave separate plants for the following year.

It is widespread in Britain and Europe, but is decreasing in England (Rich & Woodruff 1996). It is distributed world-wide in temperate areas and occurs at higher altitudes in the tropics.

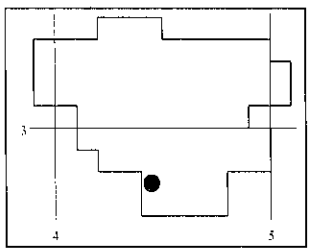
An odd, robust form has been recorded near Marden's Hill but is believed to belong to this taxon (det. A. C. Leslie). It has been recorded at 494.317, 1988, PW and 1995, TR near the old mill building.

***Fragaria* × *ananassa*. Garden strawberry.**

Tetrads 42J and 43A (Hall 1980).

A garden escape not re-recorded during our survey. It originated in cultivation, and is occasionally naturalized in Britain.

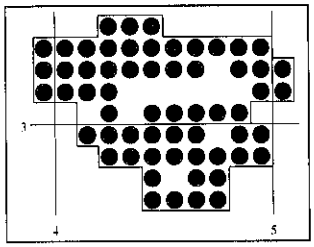
***Duchesnea indica*. Yellow-flowered strawberry.**



Bank of path near garden, Nutley (445.278), 1995, RR & PH.

Rarely established in Sussex, and mainly naturalized in southern woodlands in Britain. It is widespread as a native in Asia, but is widely grown in gardens in Britain. The fruit is reputed to be poisonous.

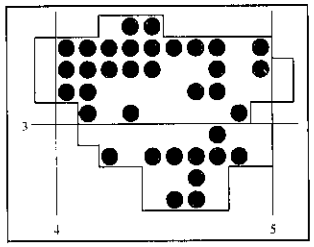
Geum urbanum. **Wood avens.**



Primarily recorded from woods and hedgebanks around the edge of the Forest, but also occasionally along the road verges in the more wooded areas where it seems to be associated with deer tracks (the achenes have a hooked barb which may catch on fur or clothing). Absent from the heath, acidic soils and waterlogged sites.

Recorded in 93% of the tetrads in Sussex (Hall 1980), and widespread in Britain, Europe, Asia and North Africa.

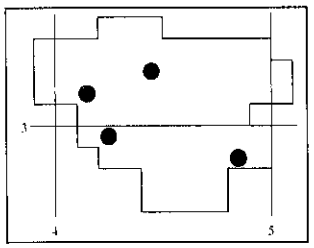
Agrimonia eupatoria. **Agrimony, Church steeple.**



Frequent on tracksides and road verges, especially on the road banks.

Recorded in 93% of the tetrads in Sussex (Hall 1980). Widespread in lowland Britain and Europe though rarer in the north; Asia Minor and North Africa.

Agrimonia procera (A. odorata). **Fragrant agrimony.**



Tetrads 42T, 43G and 43W (Hall 1980).

Verge east of Wych Cross (41.31), 1995, TR & HP; track, Streeter's Rough (423.293), 1994, TR; entrance to The Birches (446.329), 1993, PW *et al.*; verge, Poundgate (481.285), 1995, AK; less common than *A. eupatoria* and often growing with or near it.

Probably most frequent in the Weald in Britain, but generally much scarcer in Britain and Europe than *A. eupatoria*. Decreasing in England (Rich & Woodruff 1996).

Differs from *A. eupatoria* in the much more fragrant smell from the abundant yellow glands, the notched petals, and the strongly reflexed bristles on the fruits which is the best character; if it is uncertain whether a plant is *A. procera*, then it is probably *A. eupatoria*.

Alchemilla 'vulgaris'. **Lady's mantle.**

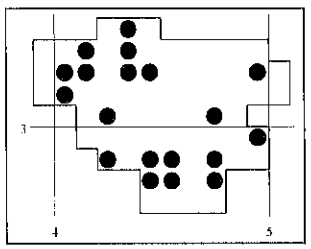
On the Forest Ridge (Hemsley 1875) - presumably Ashdown Forest as this was for the Medway district.

Alchemilla is a critical group widespread in northern Britain, but there are only likely to be two species to which this record could refer, *A. filicaulis* or *A. glabra*. Both species are now apparently extinct in East Sussex although still common and widespread in north-west Britain. Any sparsely hairy plants in natural sites should be examined carefully.

A. glabra was last recorded in the Flora area on trackside near a cottage west of Crowborough (486.304), 1968, P. C. Hall and Furnace Wood (475.263), 1970, J. Milner (tetrads 42T and 43V, Hall 1980). Other East Sussex records were Horsted Keynes 1958, Newick 1962 and Kingsfold 1966.

A. vestita was recorded on the way to Mills Rocks, East Grinstead, 1913, P. Stockdale (**BEX**; Wolley-Dod 1913), just outside our area. The other East Sussex records are Ardingly 1934 and Holebrook 1956.

****Alchemilla mollis.*** **Garden lady's mantle.**



A typical plant regularly thrown out of gardens and established on rides; for instance two roots were reported by B. Willard in topsoil imported to repair a track (*AFN* 16: 16-17). Interestingly, much more widely established on Ashdown Forest than elsewhere in Sussex, but possibly increasing in Britain in general.

It is native in south-east Europe and Asia.

Aphanes **aggregate.**

The two species of *Aphanes* are difficult to distinguish from each other except in flower or fruit, and some have been recorded only to the aggregate, which is widely recorded in open, dry places throughout the British Isles.

Both species are annuals which germinate mainly in the autumn and flower in the spring and early summer. In the mild autumn of 1995 after the hot summer there was abundant germination of plants in places where they had not been previously noted on the Forest, so they may be more widespread.

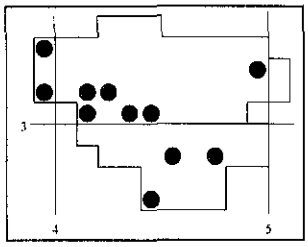
***Aphanes arvensis sensu stricto*. Parsley-piert.**
Tetrads 33V and 33W (Hall 1980).

Only recorded introduced with soil to Pippingford Park (444.303), 1993, SBRS. Locally common in Britain and Sussex on soils ranging from mildly acidic to calcareous.

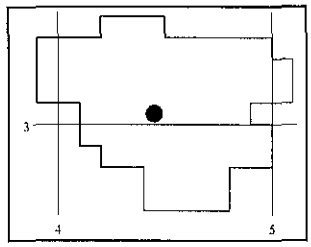
***Aphanes inexspectata (A. microcarpa).* Slender parsley-piert.**
Tetrads 43F (Hall 1980).

Much more common on Ashdown Forest than *A. arvensis s.s.* and usually found on acidic soils, especially in dry open sites. Less common in Sussex and Britain than *A. arvensis s.s.*, and predominantly western in Europe. Also found in North Africa and North America.

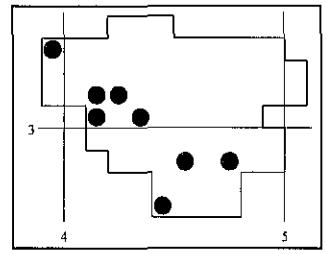
Aphanes agg.



A. arvensis



A. inexspectata

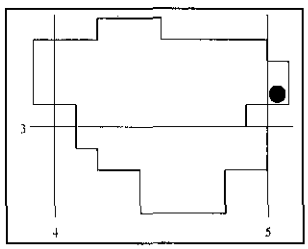


***Rosa*. Roses.**
This account is based on the BSBI Roses handbook (Graham & Primavesi 1993) which has replaced the standard 1930-1931 work by Wolley-Dod, and brought some consistency to an otherwise thorny problem. Wolley-Dod gave a name to each hybrid or form, resulting in a complex plethora of taxa as shown in his *Flora of Sussex*; this approach has now been dropped in favour of more broadly defined species which may show some introgressed characters from other species. If anyone wants to spend their life in roses there is still much work to be done on the genetics and variation.

Roses are quite variable within the species, and adjacent bushes can sometimes appear quite different. Plants are best identified with both hips and foliage (beware of cut bushes whose foliage is often untypical). Most plants of species other than *R. arvensis* and *R. canina* have been seen by TR and a few of the more difficult specimens have been confirmed by Toni Primavesi. Graham & Primavesi (1993) also note that some hybrids are quite frequent, but we have recorded very few, probably because we have had enough problems getting to know the parents, let alone their wayward offspring.

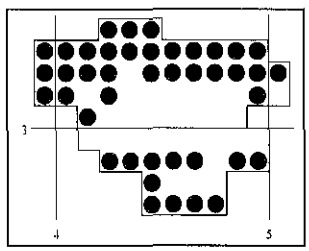
Most of the roses on Ashdown Forest are the glabrous species, *R. canina* and *R. arvensis*. The trick for finding the rarer ones is to look for bushes with lots of glands or hairs on the leaflets, but as these tend to occur singly or in pairs scattered around the Forest verges and woodland edges, many *R. canina* plants will have to be examined before they can be picked out. The rarer species are likely to have been under-recorded to some extent as new ones have been found whilst driving round hedge-crawling.

***Rosa multiflora*. Many-flowered rose.**



One large bush opposite house near St John's (50.31), probably planted, PW, 1995. It is native in eastern Asia.

***Rosa arvensis*. Field-rose.**

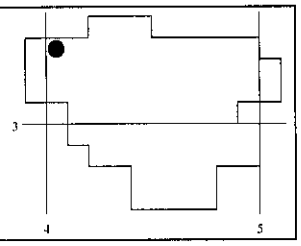


Common on the Forest (Hall 1980).

Frequent in hedges and in woodland around the edges of Ashdown Forest as clearly shown on the distribution map, and especially frequent on clays. Whilst often associated with ancient woodlands, this rose is a good colonist and also occurs on scrubby edges on the Forest, sometimes in large patches where the cream-coloured, upturned flowers contrast beautifully with the weak trailing purple-green stems. One bush on Ridge Road climbing through the trees was over 5 metres tall.

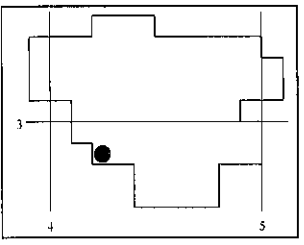
It is easily distinguished from the other species by the exerted, united styles arising from a flat disk. It is common in Sussex and lowland England, though rare in the north and Scotland, and frequent in south, central and western Europe, reaching its northern limit in the British Isles.

***Rosa* × *pseudorusticana* (*R. arvensis* × *stylosa*).**



Plants in a hedge west of stile, south-west of Mudbrooks House (402.337), 1995, PW look like *R. arvensis* but have very sparsely hairy leaves and conical discs, with variable fruits. This is the first record for East Sussex, confirmed A. L. Primavesi.

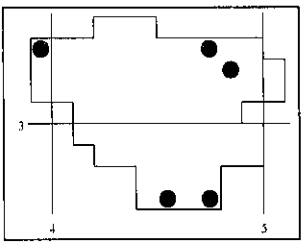
****Rosa glauca*. Red-leaved rose.**



Planted and spreading by seed and suckers on the edge of Maskett's Wood (428.285) to form large patches but scarcely naturalized.

Only rarely recorded as naturalized in Britain (usually bird-sown from gardens). Native in central Europe.

***Rosa stylosa*. Short-styled field-rose.**

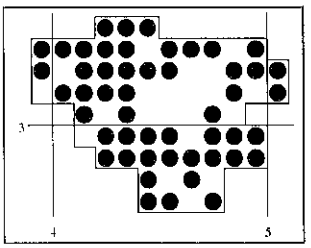


This rose may be quite overlooked in Sussex and south-east England, and will no doubt be found elsewhere too in hedges and wood edges - check hairy, upright bushes for united styles arising from a conical disc at the top of the fruit.

We have seven sites mainly on the clays; one bush in hedge east of Monkshill Farm (394.339), 1995, AK; Toll Lane, one bush outside farm (459.263) and another in hedge (452.266), 1995, TR; two bushes occur in a small unimproved field south-east of Fairwarp Farm, 1993+, PD (473.265); several on south side of Furnace Wood (479.260), 1995, TR; single plant in woodland on roadside near Chuck Hatch (471.332), 1995, PD; one plant on woodland edge by road near Fagot Stack Corner (488.324), 1995, PD. Also recorded from tetrad 43G (Broadstone Warren - golf course area) in Briggs (1990) but not refound and an unexpected place for it.

Mainly in southern Britain north to the Midlands, and locally distributed in south and west Europe.

***Rosa canina*. Dog-rose.**

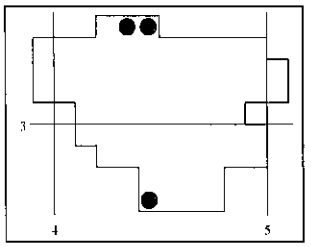


The commonest rose on the Forest (as it is in Sussex and Britain) on wood edges, hedges and verges, but absent from heath areas. One plant in woodland near Priory Road was about 6 metres tall.

Glabrous roses with free styles are likely to be this species, though it is quite a variable species and often has a few small glands on the leaves and sometimes hairs on the midribs underneath (Group Pubescentes = *R. dumetorum* auct. non Thuill.); these hairy plants are quite widespread but have not been mapped separately.

Widespread in Europe south of the Baltic, south-west Asia and North Africa.

***Rosa* × *dumetorum* Thuill. (*R. canina* × *obtusifolia*).**

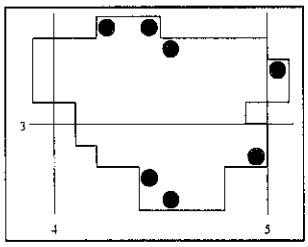


Three specimens of this hybrid collected by TR in 1995 (as *R. obtusifolia* or hairy *R. canina* !) have been named by A. L. Primavesi and are the first records for East Sussex: one bush by telegraph pole in hedge on south side of track to Hunter's Farm (448.264); one on north side of old railway line, Forest Row (437.348); several in a hedge at Quabrook (444.343). This hybrid is quite frequent where the parents grow near one another, and it shows a bewildering gradation of forms between the parents.

***Rosa obtusifolia*. Round-leaved dog-rose.**

Recorded from near Crowborough Warren by Wolley-Dod (1937) and possibly still around but not refound. It is said to be frequent in southern Britain in hedgerows and scrub, but we have very few recent records in Sussex. It is also found in central, southern and north-west Europe.

Rosa tomentosa. **Harsh downy-rose.**

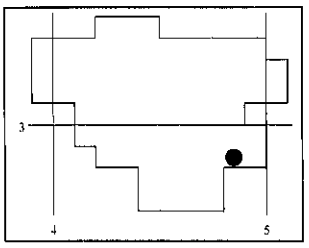


This species, our only member of the downy-rose group, has large, pointed, quite hairy leaves which look grey in colour, but no significant glands except on the peduncles. It is usually a hedgerow species which can grow to 4 metres, but also grows in scrub and on woodland edges. It occurs widely in southern Britain and is locally common on the chalk.

Rare but quite characteristic of hedges around the edges of the Flora area, especially on the north-east side of the Forest. One plant outside garden, Priory Road (421.348); west of Prickets Hatch (442.270); at least four sites around Quabrook and Parrock Lane (44.34); west end of Cackle Street (45.26); a few bushes in lane north of Hart's Farm (459.335); somewhere near Newnham (49.28); one plant in hedge by junction at Hoadley's Farm (507.325). Not yet refound in tetrad 42U where it was recorded in Hall (1980).

It occurs mainly in southern Britain but reaching Scotland, widespread in Europe except the far north, Caucasus and Asia Minor.

Rosa rubiginosa. **Sweet-briar.**

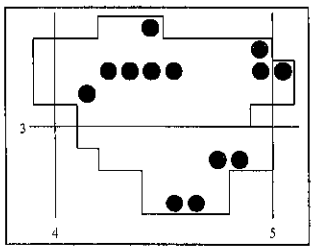


One bush on east verge of A26 near Poundgate (486.285), 1994, TR *et al.* It was mown flat in autumn 1995, but will probably re-grow.

The sweet-briar group (*R. rubiginosa* and *R. micrantha*) are distinguished by the apple-scented, long-stalked glands on the leaves, and they can sometimes be found by smell from across the road! *R. rubiginosa* is distinguished from *R. micrantha* by the hairy styles, and they also differ in habit, sepal and pedicel characters.

This rose is most characteristic of chalk soils in southern Britain (it grows on clays at Poundgate), but also occurs in hedges and on suitable soils elsewhere north to Scotland. Widespread in Europe south of the Baltic, and also found in western Asia.

Rosa micrantha. **Small-flowered sweet-briar.**

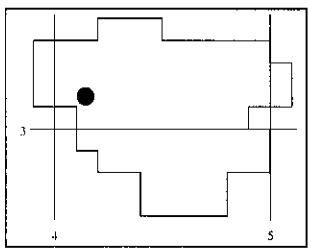


Nutley, N. J. Treutler (Wolley-Dod 1937).

Scattered around, usually as single bushes, but rarely recorded from hedges. North verge west of Wych Cross Place (418.319), TR, 1995; one bush at entrance to Birches on Ridge Road (445.329), 1995, PW, one by pond and one on road to cricket ground nearby; hedge, Quabrook (444.343), 1995, TR; one on wood edge at Newbridge (459.326), 1995, PW (another in hedge to east, not very glandular and possibly hybrid but hips trimmed off, 1995, TR); bank opposite Fairwarp turning (465.264), 1995, TR; Ridge Road west of Ashdown Park Hotel (426.324), 1995 TR & PW; one just inside entrance to Crows (or Doves) Nest (474.283), 1994, Flora meeting; one enormous bush c. 5 metres tall on track opposite Forest Lodge Farm (497.327), 1987-1995, PW; one near Fisher's Gate (493.336), 1987-1995, PW; one on roadside near St John's Church (502.320), 1995, TR;

Plants tend to have small leaves with many glands, strongly curved prickles, and glabrous styles. It seems most frequent in the eastern half of the Forest for no reason obvious as yet. It is commonest on chalky soils in southern Britain, but is scattered through the Weald. Widespread in south, central and western Europe.

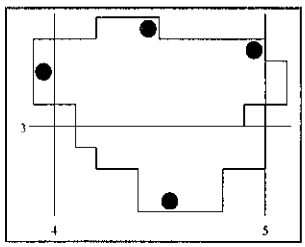
****Prunus persica.*** **Peach.**



One small shrub in bramble bush at Churlwood car park (416.310), 1993, Flora meeting, presumably resulting from a stone discarded after a picnic.

Occasionally recorded in Britain elsewhere as a throw-out. It probably originally came from China.

****Prunus cerasifera.*** **Cherry plum.**

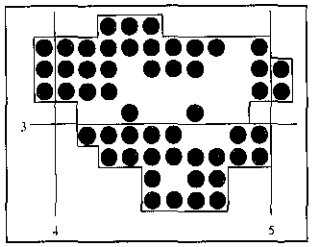


Smockfarthing area (39.32), 1995, AK; one shrub in hedge on Parrock Lane (446.343), 1995, TR & PA; one small tree in hedge opposite entrance to Boringwheel Mill Farm (456.264), 1995, TR & PA; Friar's Gate (49.33), 1995, SR.

The first species to flower in spring (excepting the flowering cherries in gardens), which is the easiest time to find it, but a search of roadside hedges in March 1995 failed to reveal any more. Non-flowering specimens in shade could also occur. No fruit was seen in 1995; it apparently fruits rarely and rather sparingly in Britain.

Mainly planted in hedges but also spread by birds, and increasing in England (Rich & Woodruff 1996). Recorded occasionally in West Sussex, probably under-recorded in East Sussex, and widespread in Britain. Native in south-east Europe and south-west Asia.

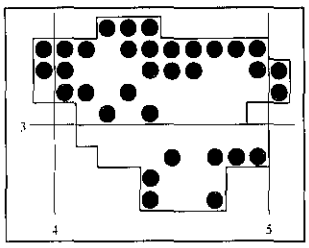
Prunus spinosa. **Blackthorn, Winter picks.**



This is usually a plant of fairly rich soils, so it tends to occur in road verges and richer woodland edges as shown in the map. Sometimes it is also planted as part of hedges but less so in this area than elsewhere in Sussex. 1995 was a very good year for fruit, and in the autumn the purple sloes contrasted beautifully with the yellowing leaves.

Ubiquitous in Sussex and Britain, and widespread in Europe south of the Baltic and found in Iran.

Prunus domestica. **Wild plum.**



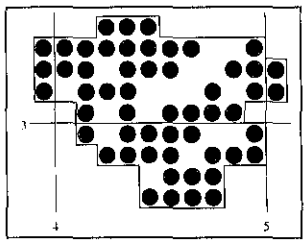
Six tetrad records from the north and south-west sides of the Forest (Hall 1980).

We have recorded it most commonly in the north, but it is also scattered elsewhere and often planted in hedges. Most records refer to isolated trees, often near habitation. Although often flowering at the same time as blackthorn, it tends to have larger flowers and forms a taller tree so can be picked out in flower from a distance.

Three subspecies are often recognised but tend to intergrade, and we have not systematically distinguished them. Subsp. *domestica* is the garden plum, which probably accounts for some of our records nearer habitation. Subsp. *insititia* is the bullace or damson, and seems to be quite frequent. Damsons were locally prolific in 1995 (many got frosted in 1994) and when stewed with lots of sugar were heavenly. Subsp. *italica* is the greengage and has not been recorded.

Widespread in Britain, and increasing in England (Rich & Woodruff 1996). Widely naturalized in Europe.

Prunus avium. **Wild cherry, Gean, Merry-tree.**



Common on the Forest (Hall 1980).

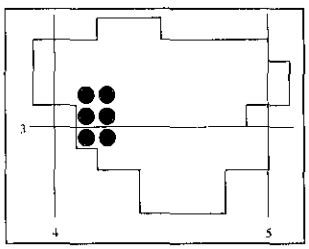
We have recorded it widely, often in open woodland where the suckers form little groves and may flower profusely even when only a couple of metres high. The large white flowers contrast with the pale first green leaves and are a merry sight in the sunlight in April. Cherries seem to be rarely produced, or maybe the birds get there first.

No cherry orchards are currently known in the area, though the Old Cherry Orchard is a local name from south of Forest Row. They have been planted recently along the lane to Black Hill (476.308), and another mature row along the boundary bank near Bank Cottage (434.338) may have been planted.

Wild cherry trees are relatively short-lived and are regularly noticed blown over, but are survived by the suckers.

Common and widespread in the Weald. Widespread in Britain and in Europe south of the Baltic but rare in the Mediterranean region. Also in western Asia and the North African mountains. Increasing in England (Rich & Woodruff 1996), possibly due to planting.

****Prunus serotina.*** **Rum cherry.**



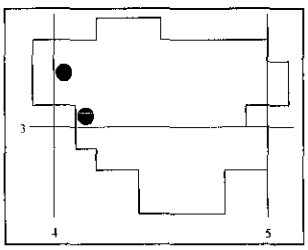
Chelwood, one tree by footpath 100 metres from houses (416.293), 1995, AK; Isle of Thorns, in several places and possibly the source of the other plants (41.30, 42.30), 1995, Flora meeting; woodland edge 100 metres west of Wych Cross (418.319), 1994, TR; verge west of Chelwood Beacon (423.294), 1993, TR; heathland south-east of Wych Cross (422.311), 1994, DK.

Quite widely established around Chelwood Gate as an escape from cultivation and also spreading aggressively on heathland elsewhere in southern Britain. These shrubs come into flower at the end of May when the pendulous racemes of white flowers are quite noticeable. Out of flower the bushes do not stand out until the leaves turn a striking red in September.

It is native in North America, where it is a shade-tolerant member of the understory of *Quercus* woodlands. It is planted for ornament and in Europe also for timber.

One wonders how many of the records for *Prunus padus,* bird cherry, in south-east England are errors for *P. serotina.*

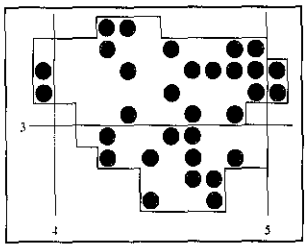
****Prunus lusitanica.*** **Portugal laurel.**



Near Goat cross-roads (40.32) and near garden, Chelwood Gate (41.30), 1993, Flora meeting.

Widely grown in gardens as an evergreen shrub, and increasingly escaping (Rich & Woodruff 1996). It is native in south-west Europe.

***Prunus laurocerasus.* Cherry laurel.**

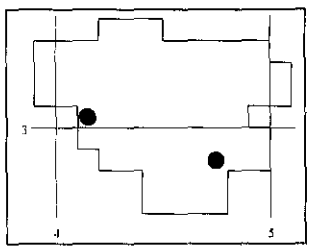


Given the number of records for the Forest in our map, it is surprisingly under-recorded in Hall (1980) possibly because such an obvious garden escape was ignored.

It is often planted near houses but now well-established and spreading, with larger groves nearer houses and small plants in the middle of nowhere. The crushed leaves produce cyanide as a metabolic intermediate, which is still used by entomologists to kill specimens; the kernel-like flavour was also once widely used for culinary purposes and was widely used for flavouring puddings and custards, or mixed with brandy sometimes with predictable consequences. Nowadays it is planted more for screening.

Fruits are produced abundantly and are spread widely, presumably by birds but perhaps also by deer which may eat fallen fruit (some stones have been seen in deer droppings). The sweet sickly scent of the candelabras of white flowers in April is quite noticeable. It casts a dense evergreen shade which suppresses all other growth underneath it. It is a growing threat to the Forest and may become a worse problem than rhododendron as it seems to be quite resistant to herbicides. Like rhododendron it comes from Turkey and south-west Asia and is spreading in Britain. It seems to appreciate our climate and grows rapidly; you could say laurel is hardy!

***Pyrus pyraster.* Wild pear.**



A275 verge, Chelwood Gate (416.306), first seen 1977 Trudy Side & PW, still present 1988, PW, DB but not seen 1993 onwards despite several searches.

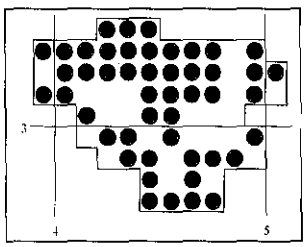
An introduced tree possibly an escape or relict of cultivation. Scattered through lowland Britain. Native in Europe.

***Malus* aggregate. Apples.**

Common on the Forest (Hall 1980).

The distinction between our cultivated and native wild apples is not clear, and we may not have recorded them consistently. Cultivated apples are usually distinct in having hairy leaves, pedicels and calyces; such plants can often be found near houses and on the urban edges and roadsides. Plants in older areas of woodland, often with thorns, glabrous leaves and calyces have been recorded as crab apples (*M. sylvestris*), but they often have hairy pedicels and very sparsely hairy leaves which according to Stace (1991) suggests that these also be called *M. domestica*. Perring (1968) suggests that the original native woodland trees were glabrous and have since become introgressed with genes from cultivated apples.

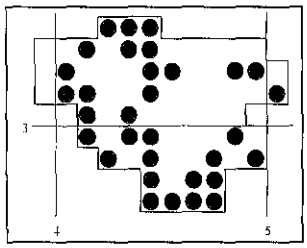
***Malus sylvestris.* Crab apple.**



It is widely recorded on the Forest but not in the acidic podzol areas, and prefers the clayey and richer soils. In April and May, the lovely pinkish-white flowers make trees stand out in open woodland and on wood edges. In 1995 the apple crop was superb, the ground underneath many trees being littered with fallen fruit. Roasted crabs were once a favourite autumn pudding, and windfalls are still collected on a small scale to make crab apple jelly. Crabtree Farm is near Camp Hill.

Widespread in lowland Britain, Europe and south-west Asia.

***Malus domestica.* Apple.**



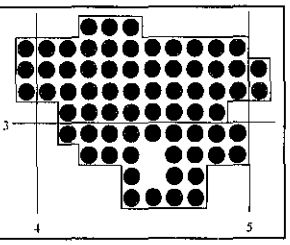
The distribution is strongly related to roads and habitation, if the former, almost always within an apple core's throw from the road. Other plants are found near habitation where they may be bird-sown or from discarded fruit. Self-sown plants usually have small, yellowish sour fruits (Stace 1991).

Forge apples are a local variety reputed to have arisen when a blacksmith near East Grinstead made some cider. He discarded the pulp by his forge, and a few seeds grew to produce a new apple (Wickens 1948). We do not know if they survive.

Deer cause a lot of damage to apple trees in orchards. Two ancient Sussex customs to get trees to bear fruit well were apple howling (where small boys howled around the tree at New Year) and 'christening' the trees on St Swithin's Day (*AFN* 14: 21-22), but sadly neither seems to be practised these days.

Widespread in lowland Britain. It originated in cultivation, and now over a thousand cultivars are known.

orbus aucuparia. **Rowan, Mountain ash, Quickbeam.**



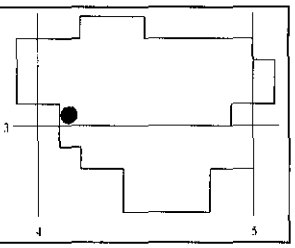
Common on the Forest (Hall 1980).

We have recorded it in virtually every square where it occurs in woodland and on woodland edges, by roads and rarely in hedges. It grows on most soils except where water-logged.

1995 was a very good year for fruit, many trees groaning under their weight at the end of July. The berries ripened red by the middle of August, and most were still on the trees in the autumn. The seeds have a winter-chilling requirement so germinate mainly in the spring. The seedlings are very shade-tolerant but are quite palatable, so trees tend to be rare in grazed woods such as around Pippingford Park.

First reported in the Weald in 1597 and oddly suggested not to be native in Kent, though we in Sussex have no esitation in accepting it. It is widespread in the Weald, especially on acidic soils, less common on the clays (Hall 1980), nd in most of Britain except the Midland agricultural belt. It is widespread in Europe, north Asia Minor and the Moroccan ıountains.

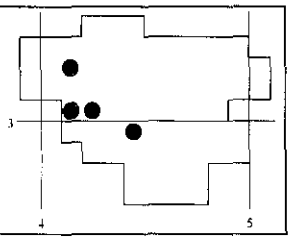
Sorbus intermedia. **Swedish whitebeam.**



One tree by lane, Isle of Thorns (417.307), 1995, TR & PA, not obviously planted.

Not recorded as established in Sussex (Hall 1980). Scattered in Britain and increasing probably as an escape from cultivation (Rich & Woodruff 1996). It is native in countries around the Baltic.

Sorbus aria. **Common whitebeam.**

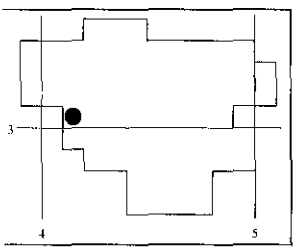


Old Lodge in plantation, 1987, MR, probably not the same tree that was seen growing on the boundary of Old Lodge in 1987, PW - neither has been refound and the latter was believed to have been lost in a fire.

Millbrook Hill, in middle of wet heath on slight mound by slit trenches (442.296), 1995 and before, DK - the tree has many stems and may have been coppiced during BTCV work; one tree 4 metres tall *c.* 100 metres west of old airstrip (424.308), 1995, MR, CM; planted in Hindleap Warren (c. 414.326), 1994, TR; one tree by path at Chelwood Gate (411.300), 1995, TR & PA. It is not native on the Forest and is probably bird-sown from the Isle of Thorns where it is planted, the trees differing in leaf shape from native West Sussex plants.

Sorbus aria has an interesting distribution in Britain, being native on the chalk and limestone in southern Britain. It nay also be native on the acidic Lower Greensand soils in the western Weald where there is a constant, smaller-leaved orm which is quite widespread. It is found throughout Europe.

Sorbus cuspidata. **Large-leaved whitebeam.**



One small tree with its very distinctive large leaves under birch tree by path at Chelwood Gate (410.300), TR & PA, 1995; this appears to be bird-sown, but it is usually planted.

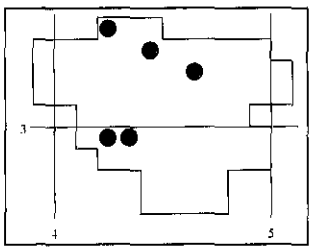
orbus torminalis. **Wild service-tree, Chequer tree, Chequers.**

lecorded from the south-east edge of the Forest in tetrad 42T (Hall 1980), but not yet refound. Recently planted in ippingford Park by A. Morriss.

This species has been studied in detail in Britain by Roper (1993). The tree is a useful indicator of ancient woodland nd hedges, and shows a marked preference for two types of soil: those derived from clays and those derived from harder mestones. In the Weald there is a strong concentration in the area north-west of Romney Marsh between Ashford and obertsbridge, spreading west more thinly to Ashdown Forest. In this area the trees grow on the Weald Clay, and Vadhurst and Guestling Clays of the Hastings Beds, but they are almost entirely absent from the Gault Clays and the shdown Sands.

It has long associations with man in the Weald, and may have been widely planted. The fruits, known as chequers, vere eaten within living memory but they are bitty, do not taste very nice and need to be bletted. They were also used to ake a cider-like drink hence the name is associated with public houses such as Chequers Hotel in Forest Row and laresfield. It occurs in Europe, Asia Minor and Algeria.

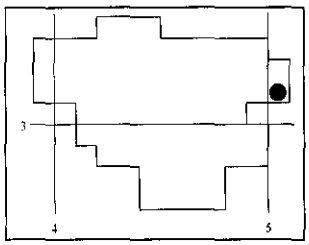
Amelanchier lamarckii. **Juneberry.**



Scattered isolated plants occur in woodland in the Braberry Hatch - Chelwood Vachery area (42.29, 43.29), 1994, TR+; three bushes in woodland, Forest Row (429.345), 1995, PW; old tree, Shepherds Gate (448.332), 1995, PW; Spring Farm area, planted (46.32), 1993.

Becoming quite widely established, often as scattered bird-sown plants on acidic soils in open woodland and scrub in lowland Britain (Schroeder 1970). Introduced to gardens possibly from North America.

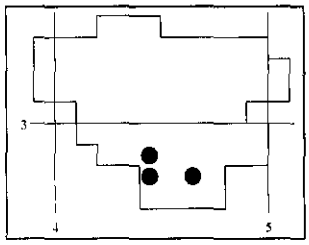
Cotoneaster* × *wateri. **Waterer's cotoneaster.**



Wall of St John's Church, Crowborough (503.317), 1995, PW (det. J. Fryer).

A hybrid grown in gardens and quite widely naturalized in Britain.

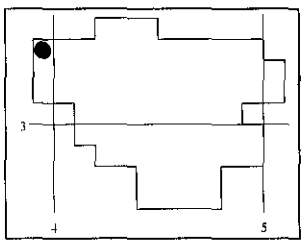
Cotoneaster horizontalis. **Wall cotoneaster.**



Recorded naturalized around Nutley.

This Chinese plant is widely grown in gardens and is commonly naturalized in Britain.

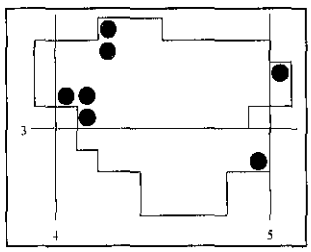
Cotoneaster hjelmqvistii. **Hjelmqvist's cotoneaster.**



One small plant *c.* 1 metre tall on roadside by Round Wood (394.339), 1994, TR & R. J. Warren (det. J. R. Palmer). It survived one hedge cutting and was still present in 1995.

It is rarely naturalized in Britain, and possibly originated from China.

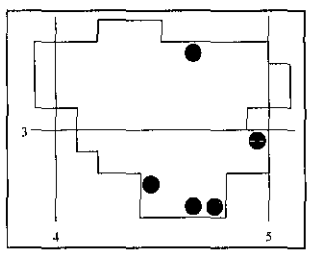
Cotoneaster simonsii. **Himalayan cotoneaster.**



Scattered records of small bushes near habitation.

Widely naturalized in Britain, usually in woods and scrub edges. Native in the Himalayas.

Cotoneaster bullatus. **Hollyberry cotoneaster.**

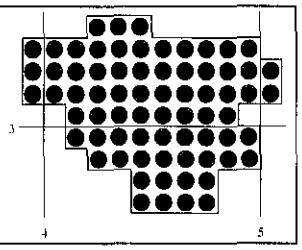


Scattered records of small bushes near habitation (e.g. track east of Jumper's Town 1995 PW, and near Summerford (469.261 and 469.262), 1993, TR+, both det. J. Fryer).

Yet another Chinese garden plant widely naturalized in Britain.

[**Crataegus persimilis.* **Broad-leaved cockspur-thorn.**
About ten scattered trees planted in Raven Wood (431.311), 1995, TR. These trees are not regenerating at Raven Wood, but are known to be bird-sown and established elsewhere in southern England. They differ from *C. crus-galli* in having slightly hairy veins on the undersides of the leaves.]

Crataegus monogyna. **Hawthorn, May, Cuckoo's bread-and-cheese tree, Agarve, Agasse, Hogarve, Hoghazel, Hog-gosse.**



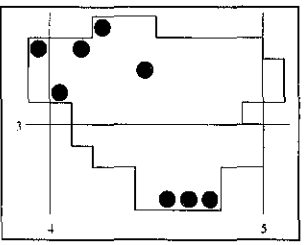
Recorded in every square on the Forest, in woods, hedges, scrub and on roadsides; rapidly colonising drier neglected grassland sites on the better soils, and only rarely a primary colonist of heaths, for example near Gills Lap (466.317). Cultivars with pink, double flowers are planted around Nutley.

This species tends to set fruit when cross-pollinated and may be largely self-incompatible. The fruits turned red at the beginning of September 1995, and were still present on the bushes in February 1996 but then disappeared rapidly in the cold weather. They are dispersed by resident and migratory birds and small mammals.

Without doubt the commonest species planted in hedges in Sussex, often with *Corylus avellana*. The 'Isle of Thorns' is an enclosure made of thorns, and the hedge includes at least some hawthorn. The Sussex expression 'gathering knots of may' has become corrupted by some to 'gathering nuts in May'.

Ubiquitous in Sussex, lowland Britain and Europe east to Afghanistan.

Crataegus laevigata × ***monogyna.*** **Hybrid hawthorn.**

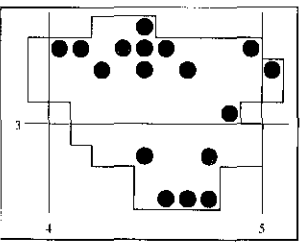


This hybrid is quite frequent around the Forest as scattered plants, and may occur in the absence of either parent, but usually occurs near *C. laevigata*. It tends to occur in open woodland and in hedges, possibly where originally planted.

Byatt (1975) analysed *Crataegus* populations in south-east England (including Ashdown Forest - the grid reference should be TQ/42.30; pers. comm. 1996) and found that most populations contain hybrids and show varied degrees of introgressive hybridisation.

It is widely recorded in lowland Britain.

Crataegus laevigata. **Midland hawthorn.**



Forest Row, H. F. Parsons (Wolley-Dod 1937). Seven tetrad records including some in the middle of the Forest (Hall 1980).

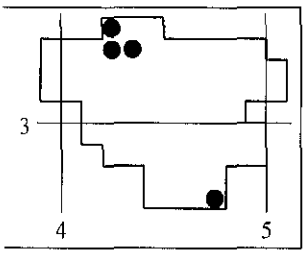
Most typically a plant of woodland on heavy clay soils (Byatt 1975) as shown clearly by the map, and usually regarded as an ancient woodland plant. Where it is frequent this may be true, but it has recolonised a number of secondary woodland sites on the edge of the Forest, as at Priory Road (412.338) and Toll Lane (461.263), presumably bird-sown. The most unusual site was one bush on the north verge of Ridge Road *c.* 50 metres east of the Ashdown Park Hotel entrance (429.324).

Crataegus laevigata and the hybrid tend to flower a couple of weeks before *C. monogyna* and can then be picked out for examination in more detail later.

Widespread in the Weald, especially on the clays, and in lowland south-east Britain. It is endemic to Europe.

FABACEAE

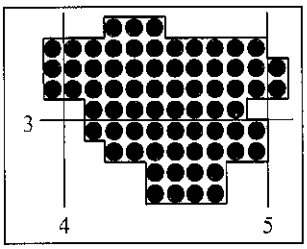
****Robinia pseudacacia.*** **False acacia.**



Two well-grown trees outside 'Dell Wood', Tompset's Bank (42.33), 1995, PW; Forest Row (42.34), 1995, PD & DB; spreading out of gardens near Bank Cottage (43.33), 1995, TR; large tree outside Oldlands Farm (477.268), 1995, TR.

Often planted and occasionally naturalized (probably mostly spreading vegetatively). Occasional in Sussex and increasingly recorded in England especially on sandy soils (Clement & Foster 1994). Native in North America.

Lotus corniculatus. **Common bird's-foot-trefoil, Boots-and-shoes, Cuckoo's stockings, Eggs-and-bacon, Lady's fingers, Milk maidens, Pattens-and-clogs, Pig's pettitoes, Shoes-and- stockings** and many more!

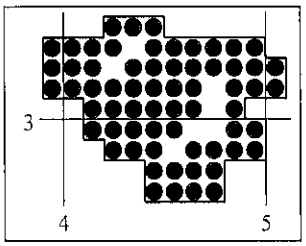


We have it from every square in car parks, along rides and in pastures. It seems tolerant of quite wet ground.

Ubiquitous in Sussex (Hall 1980) and Britain, probably the most ecologically wide-ranging legume in Britain. Widespread in Europe, Asia, North Africa and the East African mountains.

Large continental forms of this plant are often sown on road verges in so-called 'wild flower seed mixtures'. An upright form was noted on the verges of the A22 north of Nutley (44.29), 1994, TR but its origin is unknown.

Lotus pedunculatus (L. uliginosus). **Greater bird's-foot-trefoil.**

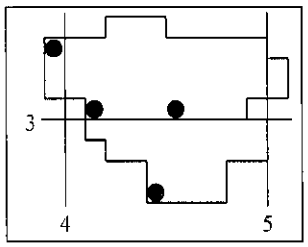


Common on the Forest (Hall 1980). Locally abundant on wet soils and in the flushes, sometimes forming quite large clumps, usually in ungrazed or lightly grazed sites.

It has nitrogen-fixing nodules in the roots with the bacterium *Rhizobium lupini*, as have most legumes. Grime *et al.* (1988) note that legumes may be rare in wetlands as the nitrogen-fixing processes need oxygen which is in short supply in water-logged soils, and this species is the only common wetland legume in Britain. It tends to occur in the drier parts of wetlands, and it is fairly sensitive to ferrous iron toxicity.

Widespread in Sussex and Britain. Widespread in west, central and southern Europe, North Africa and the Canary Islands.

Ornithopus perpusillus. **Bird's-foot.**



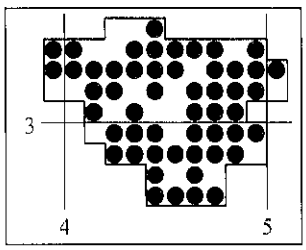
Records in Hall (1980) for the Flora area are confined to tetrad 42T (not refound), although it is recorded for two further tetrads in 42L and 42X just to the south of Ashdown Forest.

We have found it in four sites: tens of plants with *Filago minima* on road verge near Goat cross-roads (397.332), 1992, AK and seen there until 1994; lawns at Isle of Thorns (418.304), 1995, Flora meeting; abundant on the north side of a track to Hunter's Farm (449.265), pH 5.3, 1994, TR; sandy field north of Old Lodge (458.303), *c.* 1990, DK but not refound in 1994/5, DK & TR.

In the site near Goat cross-roads it appeared after clearance of a road verge, but by 1995 had disappeared as a result of the area becoming very overgrown. In November 1995 numerous seedlings were found at the Hunter's Farm locality on bare ground created by the summer drought.

This plant clearly prefers sandy rather than clayey soil and is relatively common on the Lower Greensand in West Sussex. In East Sussex it only occurs in scattered localities where, apart from the sites in Ashdown Forest, it has only been seen recently near the coast in the far south-east and in Buckhurst Park. Nationally its distribution is concentrated in the south-east but it is less common in Sussex than in the adjoining counties, and is decreasing in England (Rich & Woodruff 1996). Mainly western in Europe.

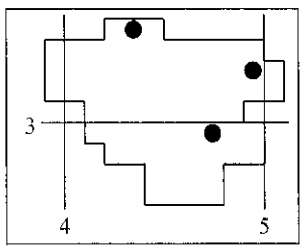
Vicia cracca. **Tufted vetch.**



Widespread but never common on the Forest, and usually on verges or climbing up hedges; the purple tufts of flowers are more readily spotted in hedges than the low-growing plants on roadsides which are often mown and do not flower. It needs other vegetation for support, and manages to pull itself up by the tendrils at the ends of the leaves.

Ubiquitous in Sussex (Hall 1980), and widespread in Britain. Increasing in England (Rich & Woodruff 1996). Widespread in Europe and Asia; in Japan and Greenland.

Vicia hirsuta. **Hairy tare.**



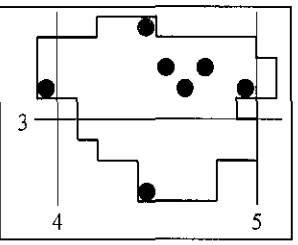
Seven tetrads on the Forest (Hall 1980).

Forest Row, verge of old railway (436.347), 1995, PW; soil dumped on roadside opposite Radio Station (473.292), 1994, SBRS; verge with disturbed soil, Marden's Hill (499.325), pH 7.6, 1993 but gone by 1994, TR.

The white to very pale lilac flowers of this species contrast with the distinctly pale blue flowers of *V. tetrasperma*. Both *V. hirsuta* and *V. tetrasperma* are distinctly rare on the Forest, with the latter being relatively more frequent despite being reported from fewer tetrads in Hall (1980).

Common and widespread in Sussex, lowland Europe, western Asia and North Africa.

Vicia tetrasperma. **Smooth tare.**

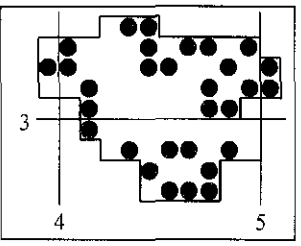


Four tetrads on the Forest (Hall 1980).

Usually found as a few plants scattered along rides, but never common, and in the farmland around. Twyford area (39.31), 1993/4, DB; south of Nutley (44.26), 1993, MM; near lake, Lines Farm (44.34), 1995, PW; Newbridge (457.326), 1994, Flora meeting; 46.31, 1993, PD; south of Chuck Hatch (473.329), 1994, TR; 49.31, 1993, MM.

Hall (1980) noted that in Sussex it prefers damper ground than *V. hirsuta*, and this may explain why it is more frequent on the silty Forest soils. It is widespread in south-east England, and rarer elsewhere in Britain. Widespread in Europe except the far north; western Asia, Japan and North Africa.

Vicia sepium. **Bush vetch.**

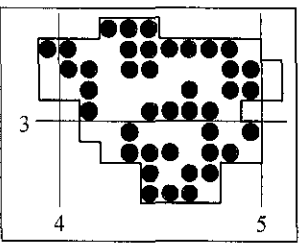


Many tetrads on the Forest, but one of the few places it is not ubiquitous in the Sussex Weald (Hall 1980).

Scattered around the Forest in the villages and on roadsides and hedges, and occasionally in open woodland. It is quite characteristic of the bushy edges of car parks.

In south-east England it tends to occur on moist soils often in partial shade but is less restricted in the north and west, perhaps reflecting a requirement for moisture (Grime *et al.* 1988). Widespread in Britain and Europe, though rare in the Mediterranean region, temperate Asia and Greenland.

Vicia sativa. **Common vetch, Fitches.**



This is an aggregate with a complex taxonomic history which means the old records are difficult to interpret, and should be treated as *Vicia sativa sensu lato* (e.g. Hall 1980, etc.).

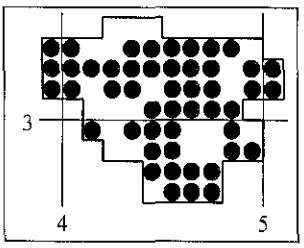
Like *V. sepium* it is scattered around the Forest on roadsides and in the villages. The commonest taxon of this group on the Forest is subsp. *segetalis* and probably all records can be referred to this. Very narrow-leaved plants were noted on track sides south of Brown's Brook (472.277), 1994, Flora meeting and could be subsp. *nigra*.

Widespread in Britain, and in Europe except the far north; temperate Asia and North Africa.

Vicia faba.* **Broad bean.

One plant on verge to Hunters Farm (449.265), possibly carried by pigeons from nearby field, 1995, TR & G. M. Kay. Gone by January 1996, probably eaten by a hungry bunny.

Lathyrus linifolius (L. montanus). **Bitter-vetch.**

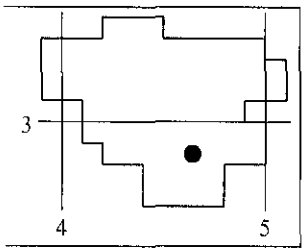


Common on the Forest (Hall 1980).

Most typical of hedgebanks and verges, sometimes in sun or light shade, usually on moderately but not strongly acidic soils. A lovely plant and one of TR's favourites.

Widespread in the Weald in Sussex but rare elsewhere. It occurs throughout Britain in woodland, moorland, unimproved grassland and hedgebanks on acidic to neutral soils; many of the sites are somewhat damp or humid. It is decreasing in England, presumably due to habitat loss (Rich & Woodruff 1996). Widespread in west, central and southern Europe to Russia, and in North Africa.

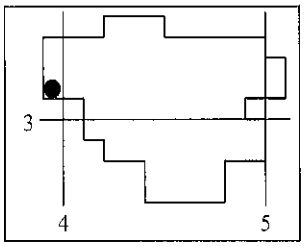
Lathyrus latifolius.* **Broad-leaved everlasting-pea.



Firebreak on heath imported on soil used to improve the track, Duddleswell (465.282), 1993, PW.

A garden escape or throw-out now widely established and increasing in Britain on roadsides, railway banks and waste ground (Rich & Woodruff 1996). Native in southern and central Europe and North Africa.

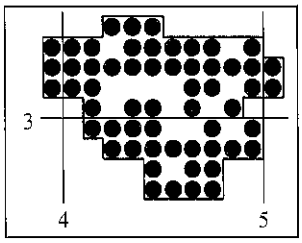
Lathyrus nissolia. **Grass vetchling, Shoes-and-stockings.**



Several plants on dumped soil outside Twyford Farm (397.312), 1994, DB & TR, but where the soil came from is another matter! This species can be very difficult to see amongst grass as its leaves match the grass leaves, but the red flowers or the pale brown pods usually give it away.

Predominantly recorded in south-east England and frequent in Sussex. It seems to be increasing by spreading along major road verges (e.g. along the M4; Rich 1994c), a favoured habitat being the tall *Arrhenatherum* grassland. In Sussex it has a patchy distribution apparently unrelated to soils (Hall 1980). Widespread in west, central and southern Europe to the Caucasus and Syria; North Africa.

Lathyrus pratensis. **Meadow vetchling, Tom thumb.**



Frequent in meadows where not heavily grazed and on verges around the Forest and most abundant on the clays or in limed meadows where the soil pH is slightly higher. The map shows it occurs mainly around the edges of the Forest, and it is absent from the heathland and woodland.

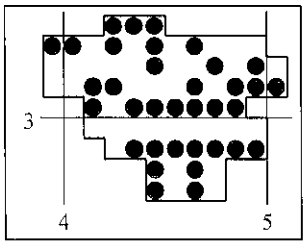
Ubiquitous in Sussex (Hall 1980), in Britain and widespread in Europe. It is also found in Asia from Siberia south to the Himalaya, and in North Africa.

Melilotus albus.* **White melilot.

Tetrad 42Z (Hall 1980), not refound.

Usually a casual scattered in Sussex on disturbed ground, and more established in the larger conurbations. Native in Eurasia and North Africa.

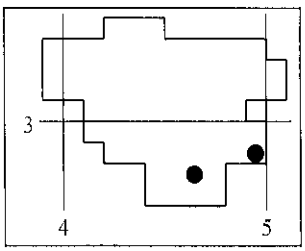
Medicago lupulina. **Black medick, Nonesuch.**



Our maps shows some interesting lines of records mainly related to the roads - it tends to occur on the more base-rich soils in open grassland on the verges which agrees with the observations of Grime *et al.* (1988) who note it is commonest on calcareous, moderately disturbed infertile soils in Britain and is essentially a colonist of bare areas. Calcareous dust from limestone chippings used to surface the roads gets deposited on the verges.

Recorded in Sussex in 90% of the tetrads (Hall 1980), and in lowland Britain. Widespread in Europe except the far north, temperate Asia and North Africa. Sometimes cultivated for forage.

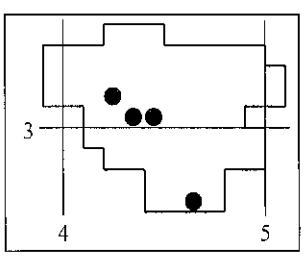
Medicago sativa subsp. *sativa.* **Lucerne.**



A few plants in rough grass at the southern end of Duddleswell car park (466.273), 1995, TR; Newnham area (49.28), 1994, SBRS.

Rarely grown now as a fodder crop though it was formerly commonly so, and consequently decreasing as an escape from cultivation (Rich & Woodruff 1996). The plants at Duddleswell may have originated from seed used to sow the car park, and it is also sometimes found in bird seed. Locally frequent on the chalk in Sussex, and scattered through lowland England. Native in Eurasia and North Africa.

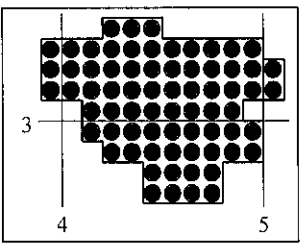
Medicago arabica. **Spotted medick.**



Bank of Long car park on foreign soil (427.311), 1995, PW; Chelwood Vachery (43.30), 1994, Flora meeting; dumped soil in Pippingford Park (444.303), 1993, SBRS; verge at Toll Lane (462.263), 1993, TR.

Very much a warmth-loving plant, and scattered along the coastal region in Sussex with fewer records in the Weald. Similarly in Britain it is only frequent in the extreme south-east of England, and occurs scattered around the coast elsewhere. Mainly in southern Europe, extending north to Britain and the Netherlands, and in North Africa.

Trifolium repens. **White clover.**

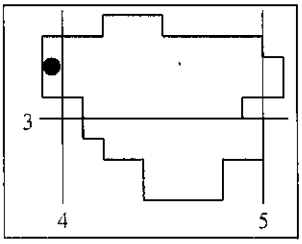


Recorded in every tetrad in Sussex (Hall 1980).

We have recorded it in every square too.

Widespread in Britain, Europe, Asia and North Africa. It is extensively sown as an agricultural crop; we have not investigated which of the numerous cultivars are established in our area.

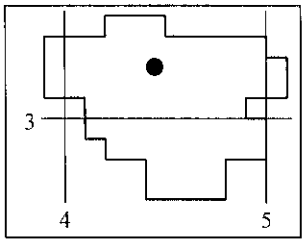
****Trifolium hybridum.*** **Alsike clover.**



Nine tetrads around the edge of the Forest (Hall 1980), surprisingly frequent as we only recorded it once, as a few plants scattered through a rushy pasture at The Farm (392.326), 1995, TR, a most peculiar place for it and totally out of character. Perhaps the decline is due to it no longer being sown on roadsides or grown as a crop.

Probably introduced throughout Britain, and widespread in the lowlands especially on verges. Native in southern Europe and Asia.

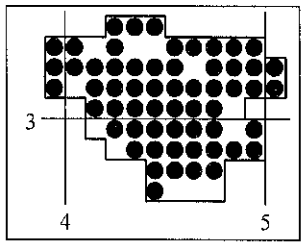
Trifolium campestre. **Hop trefoil.**



Seven tetrad records on the Forest (Hall 1980), yet we have only recorded one plant hiding under *Genista anglica* on ride near Stone Cottage (445.327), Sylvia Priestly, 1995; it is oddly rare but is perhaps more commonly associated with basic soils.

In Sussex locally common in open places on the chalk and frequent elsewhere. Widespread in lowland Britain, and in Europe except the extreme north and east, western Asia and North Africa.

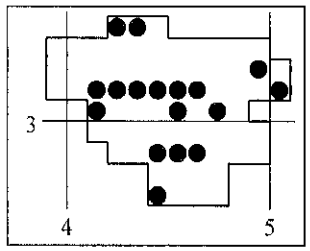
Trifolium dubium. **Lesser trefoil.**



Widespread on the Forest on verges, damp grassland, lawns, etc.

Recorded in Sussex in 90% of the tetrads (Hall 1980). Widespread and increasing in England (Rich & Woodruff 1996), possibly as it is often accidentally sown as a contaminant of *T. repens* seed (Grime *et al.* 1988). Widespread in Europe except the extreme north, and North Africa.

Trifolium micranthum. **Slender trefoil.**



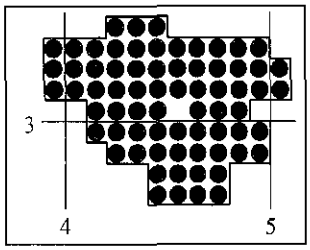
Tetrads 42N, 43W and 53A (Hall 1980).

Scattered across the Forest on damp clayey soils. 1995 was a very good year for it, with many new records from previously botanised places but it had disappeared completely by July!

This species is easily confused with depauperate *T. dubium,* especially on mown lawns, but is much rarer. On the Forest it typically has 3-6 flowers, each with a slender pedicel and a darker yellow colour than *T. dubium* but not as orange as it can be elsewhere in Britain. The terminal leaflet also has a stalk about the same length as those on the side leaflets, whilst lesser trefoil has it distinctly longer.

Perhaps commonest in south-east England in Britain, but widely scattered in open grassland and especially lawns. Western and southern Europe, the Caucasus and North Africa.

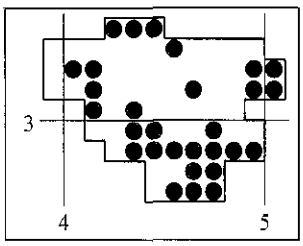
***Trifolium pratense*. Red clover.**



Recorded in Sussex in every tetrad (Hall 1980), and we have only failed to find it in one square where there are no road verges and the fields are all heavily improved.

Widespread in Britain, Europe, western Asia and North Africa. A very variable species, with many cultivars.

***Trifolium medium*. Zigzag clover.**



Common on the Forest (Hall 1980).

Locally frequent on road verges on the Forest, and only rarely in grassland.

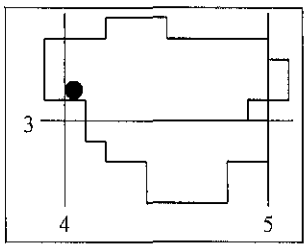
In Sussex locally frequent on heavy soils in the east and much scarcer in the west. Widespread in lowland Britain, also usually in grassland on heavy soils with intermediate fertility (Grime *et al.* 1988). It tends to occur in older grasslands and can be long-lived, to form clonal patches. These clones are self-incompatible and some isolated clones may not set seed. Widespread in Europe except the extreme north and south, Caucasus and western Siberia.

***Trifolium arvense*. Hare's-foot clover.**

Tetrad 42U (Hall 1980), but we have not recorded it.

An annual species very characteristic of dry, sandy ground and only occasional in East Sussex though locally frequent on the Lower Greensand in West Sussex. It is locally frequent in suitable sandy places in lowland Britain and Europe. It also occurs in north and west Asia and North Africa.

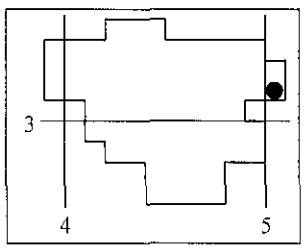
****Lupinus* × *regalis*. Russell lupin.**



Single plant on grassy verge near Sutton's Farm (401.312), 1994, DB. Probably now the commonest lupin naturalized in Britain and often confused with one of its parents, *L. polyphyllus*.

It originated in cultivation from American parents.

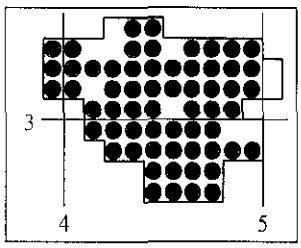
****Laburnum anagyroides*. Laburnum.**



Presumably planted in hedge, St John's (50.31), 1993, TR.

Widely established in Britain. Native in central and southern Europe.

***Cytisus scoparius*. Broom.**

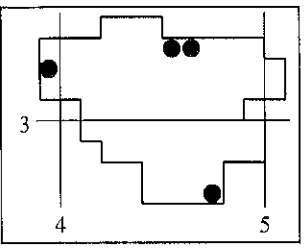


Recorded in every tetrad on the Forest except 33W (Hall 1980).

Widely recorded now on roadsides, woodland rides and disturbed areas, and much increased over the last 30 years. It is locally abundant in several areas east of Nutley, possibly on the sandier soils. At the turn of the century on Ashdown Forest it was used by commoners as a short-term thatch for animal shelters. Broomhill and Broom Farm are local names.

Very common in the Weald on well-drained, acidic soils, and widespread in similar places in Britain but rare in intensively farmed areas. It requires open conditions for establishment but can persist for some time in bracken. Widespread in west, central and southern Europe.

***Genista tinctoria*. Dyer's greenweed.**



Tetrads 42T, 43H and 43M (Hall 1980).

Recorded around the edge of the Forest in unimproved meadows on clays; a few plants in meadow, Dalingridge Farm (398.323), 1993, TR, much increased in size but not quantity after grazing animals were removed in 1995; a few plants in meadow near Coleman's Hatch (456.332), 1994, TR & SR; locally abundant in meadow at Marsh Green (463.335), 1994, SBRS; a few grazed plants in meadow east of Fairwarp Farm (472.265), 1993, PD & TR.

In Sussex it is still locally frequent on the clays in unimproved pastures, but it is decreasing in England (Rich & Woodruff 1996). Coleman (1836) recorded it as 'too common in pastures'. Locally distributed in Britain but quite widespread, and in most of Eurasia.

***Genista pilosa*. Hairy greenweed.**

All the historical records traced are given below, and seem to resolve themselves into three areas - Gills Lap (above Hartfield and Newbridge), Black Hill (road to Groombridge), and Crowborough. There are also references to 'Nutley' in the general floras but there are no details or specimens, so it should be treated as a generalisation.

On Ashdown Forest between Groombridge and Maresfield, Mr Hankey (Forster 1842; **BM**); Ashdown Forest, J. Woods, 1853 (**BM**); Plentiful on the high part of the Forest near the branching road from Maresfield to Groombridge to Hartfield (Deakin 1871); On both sides of the road on the high part of Ashdown Forest above Hartfield "this plant is plentiful in the above locality, a very wild and heathy district. It is easily passed over as *Genista anglica*", T. Walker, 1873 (**BM**); Plentiful in several places in the Forest near Nutley, Hartfield, etc. (Hemsley 1875); Crowborough, August 1877 'an autumn-flowering specimen, the usual time being the spring', W. W. Reeves (**BM**; undated in **TLS**); Ashdown Forest, 1884, G. E. M. Holmes (**BM**); Ashdown Forest, Miss A. Wallis (Arnold 1887; **BM**); Near Newbridge, 1890, C. E. Salmon (**BM**); Ashdown Forest, 1893, E. H. Farr (**LTR**); Ashdown Forest, 1893 and 1895, T. Hilton (**BTN**); near Newbridge, 1903, C. E. Salmon & W. E. Nicholson (**BM**); Ashdown Forest, 1905, E. H. Farr (**BTN**); Near Gills Lap, 1911 (Done 1914). Crowborough Warren, 1912, J. Roffey (**BM**). Ashdown Forest, F. J. Hanbury, 1916 (**BM**); near Newbridge, ?1919, J. H. Stephens (**BTN**); Ashdown Forest near Hartfield, H. S. Redgrove, 1934 (**BM**); near Newbridge, 1934, J. E. Lousley (**BM**); above Hartfield, June 1935 in flower, E. C. Wallace and August 1935 in fruit, J. E. Lousley (**BM**); In many places between Hartfield and Nutley, formerly locally plentiful, and in other parts of Ashdown Forest, several observers to 1936 (Wolley-Dod 1937). Above Newbridge, about a dozen plants; above Chuck Hatch, only one plant: all 1944, fortunately surviving damage in the Ashdown Forest area from military training, FR, C. West & J. R. Wallis (*Rep. BEC.* 12: 712).

Did Wolley-Dod over-state its frequency in "many places"? Two sites have been known within living memory, the Gills Lap area and Black Hill (M. Briggs, D. Coombe, R. Groom, A. Hoare, C. D. Pigott, F. Rose, pers. comms. 1995-6). No details of the Crowborough site have been traced.

Plants have been seen in at least two places, possibly four places, at Gills Lap. The 1944 plants seen by FR were on the west side of Gills Lap, and east of the B2026 near Wren's Warren (c. 471.320). George Dent gave detailed directions of how to find the plants on the west side of Gills Lap on Kidd's Hill (465.317), 1946, and low stunted bushes, 1948 (Dent 1928-1953). From c. 1946 Donald Pigott knew several plants c. 100 metres from the road on the shallow podzol with *Calluna, Ulex minor, Deschampsia flexuosa* and with *Genista anglica* nearby, and showed them to David Coombe in 1949. He last saw them in about 1953/4 just as the rabbits began to die out, and the area began to grow up and become invaded by scrub. The vegetation then became more vulnerable to fire, due to the bulk of combustible material, than the previously rabbit-grazed stunted heathland. Another large plant occurred on the south-eastern bank of the B2026 but that also became over-grown. FR saw them again in 1958. Gills Lap was severely burnt in May 1960, and virtually the whole colony was wiped out; only one plant was found in 1961 close to a path (Streeter 1961). This loss is the origin of the comment about the susceptibility to fire in Briggs (1990), though Coombe has observed its ability to survive light fires on the Lizard. Another possible hairy plant (90% sure, but unconfirmed!) was found by AH in 1980 on the east side of the road about 50 metres north-east of the junction at Gills Lap, but when he returned to check it in flower a couple of weeks later the verge had been mown flat and there was no sign of the plant. Neither AH nor Coombe could refind it in 1981.

The second site, on the old Roman road north-east of Greenwood Gate Clump at Black Hill (476.312), was refound by Ron Groom on 6 June 1965, following up a reference to the road from Maresfield to Groombridge in Forster and Deakin (cf. above), and clearly where the plant had been lurking ever since. He searched the heathland and found first *G. anglica* and then by sheer luck "at least eleven clumps of *G. pilosa* in flower but no fruits formed yet". They were growing with bushy heather c. 60 cm high, and the *Genista* was also of a similar height. He revisited the site in August 1971 but it had altered appreciably with an extensive area burnt, and the ride had been widened into the *Genista* patch as a firebreak. He eventually found two prostrate plants on the ride with a few fruits and still a few flowers. Ron assumed his site was *the* known site, but whilst talking with Ted Wallace in 1972 it became apparent that it was a different one to the extinct site at Gills Lap. On 18 April 1973, Ron and Ted went to the Forest to meet Mary Briggs, and they searched unsuccessfully for an hour, eventually giving up and having a picnic. Later that day, Ron and Ted returned for a final search and found one plant on the ride almost where they had lunched! On 3 August 1973, Ron searched again: "*Genista pilosa* was refound by the ride. Two large plants were located, the one seen in April and another, as large, a yard away; each was over a foot across with numerous offset rosettes but no sign of it having flowered this year. Both looked fairly vigorous and healthy". In 1974, Mary and Alan Briggs "on a perfect June evening, found the lay-by, walked onto the heath in the sunset - *G. anglica* was in full flower and standing out brightly in the evening sun, but a little further on a low clump of deeper yellow... *G. pilosa*!" One large floriferous tussock and three smaller plants each with a few flowers scattered nearby". The

plants were photographed by Peter Wakely for the Nature Conservancy Council in June 1974 (see Plate 1). On Mary's next visit, the plants were almost under a pile of logs constructed for a horse jump, and this was to be the death of the plants. On 10 March 1975, David Coombe found the site severely damaged by pony jumping, one plant had at least a third of its branches damaged and the surviving part was about 20 cm in diameter. Ron visited the site again in August 1976 "the furzy ground between the road and the main ride has been burnt this year and the fire came within a few feet of the plants. The plants appear to be doing well but no sign of the fruits. There are two main clumps with a number of separate plants in each, very prostrate here" and again in June 1977 "we found three plants this time, two very prostrate and hardly growing well with no flowers, the third on the edge of the ride just a few inches from last year's burnt ground - this flowering sparsely. The *Genista pilosa* seems to be in a precarious situation". This appears to be the last record (incorrectly cited as 1978 and 1979 in Briggs 1990) and despite repeated searches it has not been seen since. In September 1979 David Coombe failed to refind it, noting much erosion and pony jumps. Searches by the SBRS in *c.* 1982, 70 botanist hours by Lady Rosemary Fitzgerald and co-workers for the Nature Conservancy Council in June 1987, Ron Groom in 1993 and a Flora meeting in 1994 also failed. For the record, the plants occurred 202 paces along the track from the edge of the road, opposite the lay-by with the post box by Heasman's Lodge Farm entrance.

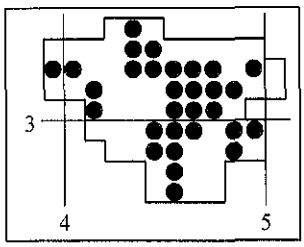
The loss of this Red Data Book species is perhaps one of the most significant losses from Ashdown Forest, and the plant is now extinct in south-east England. Attempts had been made on several occasions to draw attention of several relevant authorities to the plight of the Gills Lap and Black Hill plants, but no action was taken (Streeter 1961). Even as long ago as 1915 a local botanist W. E. Nicholson hoped N. Charles Rothschild and his recently formed Society for the Promotion of Nature Reserves would be able to provide 'some form of protection' for *Genista pilosa* which had suffered 'grievously' from Forest fires started by soldiers camped where it grew (pers. comm. P. Marren, 1996). The plant can be incredibly difficult to see when not in flower as it often grows prostrate forming mats amongst other vegetation, but the large, bright yellow flowers for a short period in May-June are more obvious, and it looks like a small prostrate broom, quite different from petty whin. It could still lurk somewhere on the Forest - the old records indicate it was once quite widespread. If dormant seed is still present in the soil it could reappear again if disturbed, as legumes generally have a long seed viability.

Genista pilosa is an interesting species with an odd distribution and ecology in Britain. Its main and most familiar habitat now is sea cliffs in west Cornwall and Pembrokeshire, where it may often be abundant on the tops of cliffs and slopes on generally open ground, on serpentine or base-rich soils. It has also been known for many years on ledges out of the reach of sheep on the weakly basic soils over half-way up Cadir Idris at altitudes of 1300-2000 ft in mid Wales, and was found more recently growing on limestone pavements in the Brecon Beacons. It was last definitely reported on the dry heaths of the Breckland prior to 1866. In south-east England it has been recorded in Ashdown Forest, and from Wrotham Heath in Kent in 1831, Prof. Henslow (**BM**). Details of an unconfirmed locality at Broadwater Forest (Wolley-Dod 1937) are lacking; a letter from A. H. Wolley-Dod to FR in 1943 "My notes say the late E. D. Morgan found it on Broadwater Forest. No other details...". These widely scattered sites with markedly different climates and soils indicate a relict distribution from more widespread occurrences earlier in this interglacial period.

It is likely that plants from different parts of Britain are ecotypes adapted to different soils. Plants grown from cuttings from plants on basic soils in Cornwall have grown well in the Cambridge University Botanic Garden on a calcareous sandy loam for over 30 years, and retain their prostrate, mat-like habit. On the other hand, rooted cuttings taken in 1975 from already damaged Ashdown Forest plants, growing on acid podsolized soils, grew for about two years at Cambridge but suffered severe chlorosis (presumably lime-induced) and did not survive as unfortunately they were not treated with sequestrene. Not only were the last-seen Sussex plants more straggly and upright than western cliff-top plants and possibly less silky-hairy, but they were probably physiologically different too. It is notable that in central Europe it can grow to 1 metre tall, and is almost certainly different from the coastal plants in north and west Europe.

In Europe Ellenberg (1988) classifies it as a sub-oceanic plant indicative of fairly warm conditions which usually occur in open well-lit places and sometimes in partial shade. It is described as a calcifuge, usually on soils poor in available nitrogen but variable in soil moisture, and it occurs in a similarly broad range of habitats. It occurs in the dry lowland *Calluna* heaths of northern Germany near the Baltic which are presumably similar to our Breckland and Ashdown Forest sites. In the sandstone hills of Rhine Palatinate, C. D. Pigott noted it abundantly in dry heathland with *Calluna* and also in the more open parts of *Quercus* - *Castanea* scrub. At Fontainebleau near Paris, FR noted it abundantly in patterned heathland on the acidic soil stripes with *Calluna* and *Erica cinerea*, but absent from the calcareous soil stripes which have *Pulsatilla, Veronica spicata*, etc. It occurs in sub-oceanic *Quercus robur* - *Pinus sylvestris* woods with *Fagus* on the acid soils on the northern plain of central Europe which are possibly similar to the original woodland type of Ashdown Forest before it was cleared, and in the *Pinus nigra* woods on limestone with calcicoles on the eastern edge of the Alps at altitudes of 700-1200 metres which may be similar to the Brecon Beacons site. In Bosnia it ascends to 1950 metres altitude, and in the eastern Alps well above the tree line (Hegi, *Ill. Flora Mittleuropa*), and in the Czech Republic it grows on dry continental steppe heath with *Veronica spicata* and *Carex humilis*. In this context, the sea cliff sites in Cornwall and Pembrokeshire are the odd ones out!

***Genista anglica*. Petty whin, Needle furze.**

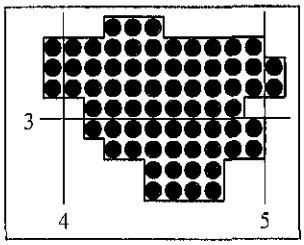


On Ashdown Forest (Coleman 1836). Ashdown Forest 1904, J. Stirling (**TLS**). Near Gills Lap; Friar's Gate (Done 1914). Frequent on the Forest (Hall 1980).

Concentrated on the east side of the Forest in the Gills Lap to Camp Hill area (e.g. abundant on rides near Stone Cottage), and also elsewhere where there is good heathland. Ashdown Forest is the centre of its distribution in Sussex, and it is surprisingly rare on the Lower Greensand in West Sussex. Like many other plants of lowland heaths it is decreasing in England (Rich & Woodruff 1996), but it is still scattered on upland moorland in eastern Scotland. It occurs in western Europe from Sweden to Italy, and in north-west Africa.

Be warned, plants may sometimes be spineless (var. *subinermis*) and sometimes hairy ... which does not make them *G. pilosa*; we have not as yet noted these variants on the Forest.

***Ulex europaeus*. Gorse, Furze, Hawth, Hoth.** (Plate 5)



"Customary tenants ought by custom to have heath, bracken and gorse to burn for their needs" *Extent of Ashdown Forest*, 1274. Ubiquitous on the Forest (Hall 1980).

Gorse generally tends to occur on acid brown earths rather than heath podzols (Proctor 1994), so it is often abundant along roadsides, heath margins, acidic grassland and in open scrub and is one of the commonest plants on the more open areas and roadsides on the Forest. A good place to see the contrast is south of Gills Lap where it lines the road but is infrequent in the heather to the east and west, though it is abundant on the steep slopes around Gills Lap itself. Soil pHs measured at eight sites range from 2.8-5.6 with a mean of 4.1 (± 0.3 s.e.). In some areas it dominates whole areas and forms dense groves; plants opposite Churlwood car park were 2.6 metres tall.

In spring the flowers scent the air with coconut and create swathes of yellow across the Forest. Later the ripe pods splitting open with a sharp snap to scatter the seeds is a familiar sound on sunny days in July. The flowering of gorse is notoriously variable from year to year. 1994 was a poor year for flowers, but in 1995 it started flowering profusely in January, which was very early and continued until mid May. If it flowers early, does it set seed?

At monthly intervals in spring 1995, PA and TR labelled ten flowers on each of 21 plants and followed them through to fruit-set. Quite a lot of the earlier flowers aborted but some did set fruit - significantly fewer in February and March than later. Only the February flowers had lower numbers of seeds in each pod, so even if kissing is in season, reproduction is too!

However, with the exception of those February flowers most of the seeds in the pods were predated by either the gorse weevil (*Apion ulicis*) or a micro-moth. These seed predators are easily seen in nearly ripe pods - the weevils are greyish and have long snouts, the micro-moth larvae are little caterpillars. Once predation has been taken into account, the actual percentage fruit set varied surprisingly little. The weevils cannot escape from the pods themselves, and have to wait until they split open - so the familiar crack of pods may be more usually indicative of weevils flying through the air than seeds.

Summary of fruit and seed set in *Ulex europaeus* in 1995 near Long car park (10 flowers were marked on each of 21 bushes at approximately four week intervals).

Date flowers marked	4 Feb.	5 March	2 April	29 April
Number of bushes flowering	6	12	20	21
Mean number of pods harvested per bush	3.2	3.3	6.2	5.3
Mean number of seeds per unpredated pod	1.8	4.5	4.5	4.6
Mean percentage pods predated	5.3%	76%	61%	64.5%
Mean number of good seeds per pod	1.8	2.2	2.3	1.9
Mean chance of ovule producing seed	5.5%	4.4%	10.8%	8.1%

Gorse was widely used on the Forest for roofing, fuel, cooking, bread making, and brick and lime kilns (Steele 1936; Leppard 1980; Irons 1982). The spines protect it to some extent from grazing, and the plant was crushed in a special mill so it could be fed to animals. Others note that the thorns are remarkably persistent in the skin, some taking six days to get out. Blooms are still collected on the Forest to make wine, and there were authorised sales by the Wood Reeve of gorse for horse jumps and for planting. Arthur (1989) records that sticks of gorse from Ashdown Forest were sold for umbrella handles. A very readable account of gorse, including the economic uses and folklore, is given by Humphries & Shaughnessy (1987).

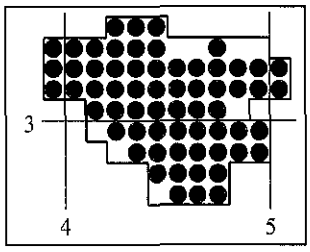
Gorse is a predominantly western plant in Europe, but is widespread in Britain. It is also widespread in Australasia as an introduction and is a noxious weed. The potential for controlling it using the weevils has been investigated but has met with little success.

Ulex gallii. **Western gorse.**
Kidd's Hill, A. H. Wolley-Dod and W. Ingwersen (Wolley-Dod 1937). Introduced to the Wych Cross area in the 1960s by M. Woodman as an experiment, but not currently known.

This species occurs widely in the north and west of Britain and just reaches West Sussex, but also occurs in Kent and East Anglia. Endemic to western Europe form Spain to Scotland. It is somewhat sensitive to frost.

Care needs to be taken in separating it from *U. minor*; *U. gallii* populations usually have a mean calyx length of more than 10 mm, whilst *U. minor* populations have them less than 9 mm.

Ulex minor (U. nanus). **Dwarf gorse, Dog furze.**



Ashdown Forest (Coleman 1836). On the Forests around Crowborough (Done 1914). Abounds on some of the heaths in East Sussex, such as Ashdown Forest (Wolley-Dod 1937). Common on the Forest (Hall 1980).

On the Forest, it occurs mainly on dry heath with *Calluna*, and on wet podzolised heathland soils with *Molinia* and *Erica tetralix*. The soil pHs of seven sites measured range from 3.2-4.1, with a mean of 3.7 (± 0.13 s.e.). It grows predominantly in the open, but will survive for a few years in open secondary woodland where it can grow to 1.5 metres tall. Our map shows it from all squares with significant areas of heathland, and it is only absent from some areas around the edge. Elsewhere in Britain it occurs on chalk 'heaths' and sandy glacial drift (Proctor 1994). It is palatable and is suppressed by heavy grazing.

It flowers profusely in August and September, the deep yellow flowers contrasting beautifully with the purple heather. The fruits do not appear to be predated by weevils, and they over-winter and ripen in the spring (this seems to be very unusual in British plants). Seeds are slow and erratic to germinate, but seedling establishment can take place rapidly after fire.

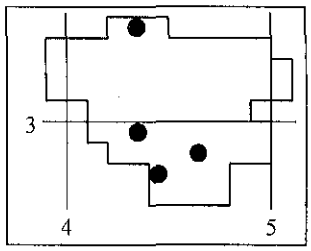
This plant is one of the real treasures of lowland heaths in the south-east of England, with a few scattered localities in the East Midlands, North Wales, Lancashire and Cumbria (Proctor 1994). The populations on these heaths represent a major part of the world population as, outside England, it is confined to the western edge of France, Spain and Portugal, but gives way to *U. gallii* along the Atlantic margin.

The British distribution of *U. minor* scarcely overlaps at all with that of its close relative *U. gallii,* western gorse, which has a similar ecological niche.

HALORAGACEAE

[***Myriophyllum verticillatum.*** **Whorled water-milfoil.** Pond on Ashdown Forest, E. Jenner (Arnold 1887). A surprising record as it tends to occur in base-rich water and probably an error? The whereabouts of Jenner's herbarium is unknown so the record cannot be checked.]

****Myriophyllum aquaticum (M. brasiliense).*** **Parrot's-feather.**



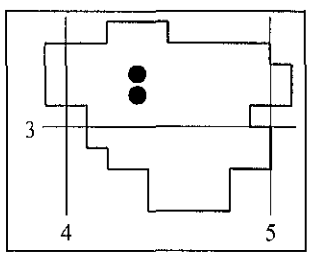
Tetrad 42U (Hall 1980). Duddleswell, 1976, C. T. Prime, 1978 J. Milner (Milner 1979).

Planted around pond at Chelwood Vachery (431.297), 1994, TR; pond on golf course, Forest Row (436.342), 1995, TR, and one of the few plants to survive bulldozing in September 1995; pond by Prickets Hatch (443.270), TR & PA, 1995; Ellison's Pond, Duddleswell (462.287), 1986+, DB & B. Wurzell, growing to practically fill the pond by 1995 - this may be one of the longest established sites in Britain.

This invasive plant, which first became naturalized in Britain sometime in the early-1970s (Chicken 1977) as a throw-out from aquarists' ponds or with tadpoles or terrapins, is now becoming widely established in Britain. It may even be able to out-compete *Crassula helmsii* by over-growing it. It is reputed to be frost-sensitive but has survived freezing conditions on Ashdown Forest (Milner 1979, Hall 1980) and has certainly thrived in the run of mild winters. PW has also cultivated material from Ellison's Pond and observed that it is tolerant of cold; shoots were blackened by frost but in the spring put up new green shoots. We suggest it should be eradicated as soon as possible after it has been discovered.

It is native in South America.

Myriophyllum spicatum. **Spiked water-milfoil.**

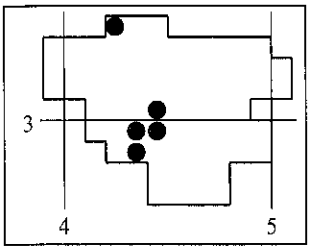


Pond on Ashdown Forest near Wych Cross (Whitwell 1902).

Both sides of ornamental pond at Ashdown Park Hotel (431.320), 1995, TR & PA, one site but two squares, and interestingly in the same areas as Whitwell's record.

In Sussex it occurs predominantly near the coast in streams, lakes, ponds and ditches, sometimes in quantity (Hall 1980). It is widespread in Britain and is possibly commonest in the south and east, where it occurs in base-rich, moderately nutrient-rich water. Widespread in Europe, Asia, North Africa and North America.

Myriophyllum alterniflorum. **Alternate water-milfoil.**



Pond near Coleman's Hatch, C. E. Salmon (Wolley-Dod 1937).

One isolated record in the fishing lake at Forest Row (422.347), 1995, TR, and then a series of ponds and streams along the Pippingford watercourse downstream from the pond in Chelwood Vachery (431.295), 1995, MR, PR & TR, to pond in Mill Wood (437.288), 1995, MM & TR, to a pond (448.299) and several lakes (44.30) in Pippingford Park, 1995, SBRS etc. In 1995 it flowered freely, possibly because of the warm weather.

This was recorded in Hall (1980) from five tetrads just south-west of the Forest but not on it, and in Sussex is quite a rare plant. It tends to occur in base-poor and nutrient-poor water such as drains from the acidic, uncultivated areas of the Forest, and is most frequent in the north and west of Britain. Mainly in west, north and central Europe, Greenland and the Azores.

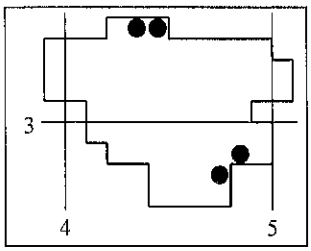
GUNNERACEAE

[***Gunnera manicata.*** **Brazilian giant-rhubarb.**

Bottom of Dodd's Hill (450.269), 1995, AK. Planted around pond at Chelwood Vachery (431.297), 1994, TR, but not naturalized. The species is spreading vegetatively in damp woodlands and meadows in a number of parts of Britain, and spreading by seed in the Channel Islands and western Ireland. It is native in southern Brazil.]

LYTHRACEAE

Lythrum salicaria. **Purple loosestrife.**



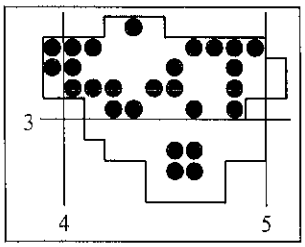
Tetrads 43H and 43M along the Medway (Hall 1980).

One plant in wood east of ford at Shalesbrook (435.342), 1995, PW; damp ground on field edge near Lines Farm (443.348), 1995, Flora meeting; several clumps in dryish ditch at bottom of Oldlands Hall formal gardens (476.274), 1995, R. Barley *et al.*; Poundgate (48.28), 1994, TR.

Mainly in the main rivers and associated wetlands in Sussex (Hall 1980), and quite widespread in the lowlands of Britain. It is decreasing in England (Rich & Woodruff 1996). Widespread in Europe except the far north, Asia and North Africa.

This beautiful purplish-pink plant was introduced to North America in the 1800s, and now billions of plants blanket many of their finest wetlands. Plants can produce 2.7 million seeds annually which are dispersed by water, animals and birds, and it is a severe threat to the natural flora and fauna as nothing there eats it. A good biological control agent would be worth patenting!

Lythrum portula. **Water-purslane.**



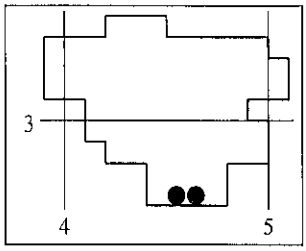
Considering that it was only recorded in tetrad 43L in Hall (1980) when it must have been overlooked, we have recorded it very widely. It is very characteristic of the wet hollows in muddy tracks, and in shallow ponds with base-poor and nutrient-poor water. In the hot summer of 1995 it was conspicuous turning reddish as it dried, but still we only added a proportional one third of records so not necessarily more abundant in dry years.

Scattered throughout the Weald in wet places in open communities, and possibly the area in which it is most common in Britain. Widespread in Europe except the far north, Siberia and the Azores.

This species shows a cline in the length of the calyx segments (Allen 1954), with plants in western Britain and Europe having them 1.5-2 mm long (subsp. *longidentata*) compared to 0.5 mm in plants from elsewhere (subsp. *portula*), though why is unknown. Plants from Jack Daw had very short calyx segments, but they are longer in other plants; we have not investigated them in detail.

THYMELAEACEAE

Daphne laureola. **Spurge-laurel.**

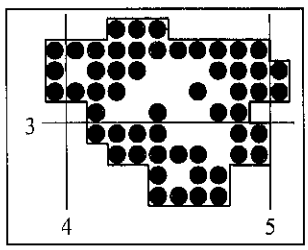


One plant on eastern edge of Courtland Wood (451.261), 1995, TR; five plants by Marlpits (467.264), 1993, TR & NM.

The occurrence of this 'calcicole' at the Marlpits might be expected to be related to calcareous clay, yet the pH of the clay was 3.9 and the leaf litter around was 4.6 (these were double-checked), and at Courtland Wood pH 5.3. At Marlpits the plants were also quite damaged by grazing with many weak shoots, and they flowered only very sparsely.

Mainly in woodlands on the chalk in Sussex, and rarer on the clays in the Weald (Hall 1980). Locally common in England and Wales in chalk and limestone woodlands. It reaches its northern-most distribution in Britain, and occurs in southern and western Europe and temperate Asia.

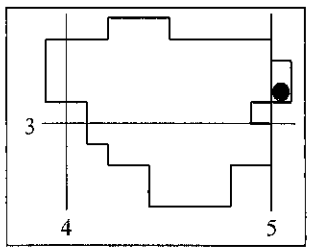
Epilobium hirsutum. **Great hairy willowherb, Codlins and cream, Gooseberry pudding.**



This handsome plant of marshy and other damp places, including road verges, is ubiquitous in Sussex according to Hall (1980) but is not quite so widespread in Ashdown Forest. The blanks on the map for such a conspicuous and well-known plant as this one are likely to indicate real gaps in its distribution with some degree of accuracy and, in many cases, correspond to the main areas of heathland.

Common in England and increasing but absent from much of Scotland and Wales (Rich & Woodruff 1996). Widespread in Europe, temperate Asia and Africa.

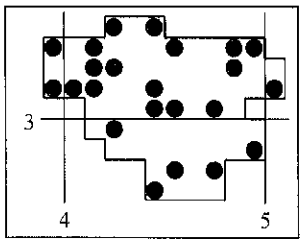
Epilobium ciliatum x hirsutum.



A single record from the car park, St John's (505.316), 1991, PW, det. G. Kitchener. It is occasionally recorded in Britain where the parents meet.

This car park and its hybrids were first discovered by PW, who suggested they should be investigated in more detail. There seems to be some very promiscuous *E. ciliatum* about!

Epilobium parviflorum. **Small-flowered hairy willowherb.**



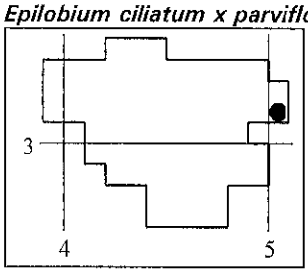
Common on the Forest (Hall 1980).

Scattered over the Forest in damp places but avoiding the more acidic areas. The British distribution is rather similar to *E. hirsutum*. It is found over much of Europe, western Asia to India, and North Africa.

Epilobium obscurum x parviflorum.

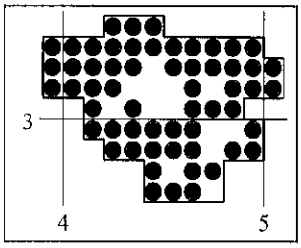
Roadside near Kidbrook Park, det. G. M. Ash (Wolley-Dod 1937). Surprisingly, another possible plant was found in Kidbrook Park in 1995, TR & PA.

Epilobium ciliatum x parviflorum.



Several plants in a car park, St John's (505.316), 1992, G. Kitchener.

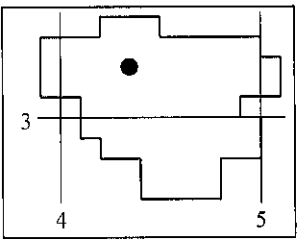
Epilobium montanum. **Broad-leaved willowherb.**



This is the commonest *Epilobium* species in Sussex (Hall 1980) and, jointly with *E. obscurum*, the most common in our survey. It is found most often in woods, hedgebanks and road verges but also occurs as a garden weed. Its distribution in the Forest is rather similar to *Primula vulgaris* and *Arum maculatum* which are clearly associated with woods and shady hedgebanks.

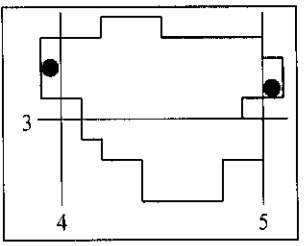
Widespread throughout Britain apart from some areas of Scotland. It occurs in most of Europe, western Asia, Siberia and Japan.

Epilobium montanum x obscurum.



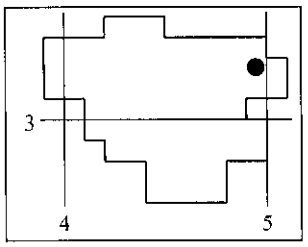
Found with both parents on verge of private road, Broadstone Warren (431.323), 1995, PW (confirmed TR).

Epilobium ciliatum x montanum.



One plant in flowerbed with parents, Horncastle House (391.325), 1995, DB; several plants, car park, St John's (505.316), 1992, G. Kitchener; one plant just east of southern bridge in Pippingford Park, 1995, G. Kitchener on the SBRS/KFC field meeting. This is now probably the commonest hybrid *Epilobium* in Britain (Stace 1991).

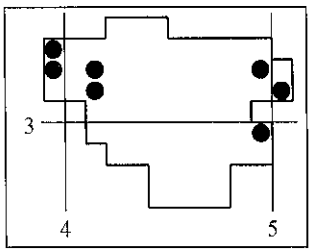
Epilobium lanceolatum. **Spear-leaved willowherb.**



Roadside bank by woodland, Church Hill (498.325-6), 1987, PW (det. FR), and still present in 1993. FR has a particular interest in this species and has suggested that it is currently increasing in Britain.

Epilobium lanceolatum is a rather uncommon plant of dry, rather open habitats. Britain lies at the northern extreme of its range and it is only found south of a line from the Wash to Snowdonia (Mountford 1994). It occurs in southern and western Europe, western Asia and North Africa.

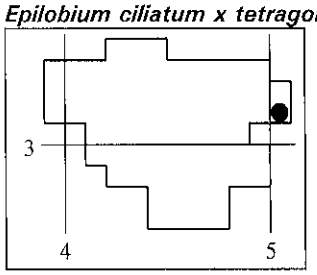
Epilobium tetragonum (Epilobium adnatum). **Square-stemmed willowherb.**



Surprisingly scarce in our survey with only seven records, all confined to the eastern and western edges of the Forest. Hall (1980) shows a very different distribution with the majority of records in the central southern part of the Flora area. The reason for this difference is not at all clear.

It occurs in lowland Britain but is rare in the north and Ireland, and in Europe north to southern Sweden and in western Asia.

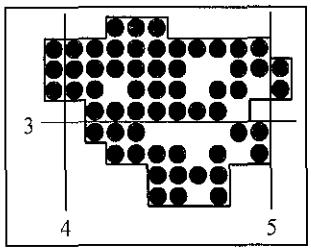
Epilobium ciliatum x tetragonum.



One plant in a car park at St John's (505.316), 1992, G. Kitchener.

This hybrid is recorded occasionally in Britain.

Epilobium obscurum. **Short-fruited willowherb.**

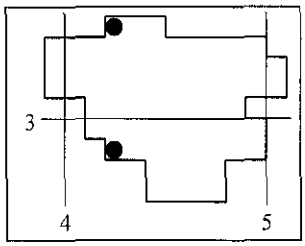


Common in our survey, especially toward the west of the Forest. Generally in rather damp places.

Care is needed to distinguish this species from *E. tetragonum*. The glandular hairs on the calyx tube which indicate *E. obscurum* are very inconspicuous and careful examination, preferably with a lens having a magnification greater than ×10, is necessary in order to differentiate correctly between the two species.

Locally common over the whole of Britain and much of Europe, also North Africa, Madeira and the Caucasus.

Epilobium roseum. **Pale willowherb.**

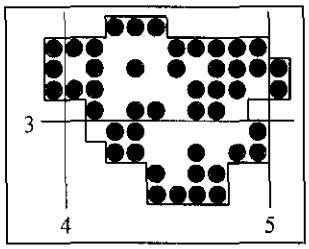


Chelwood Common, Miss M. Cobbe, and Forest Row (Wolley-Dod 1937). Tetrad 43F (Hall 1980).

One plant by road to Chelwood Farm (426.287), 1994, TR; locally frequent in Forest Row on edges of pavements and flower beds, especially near the old school (427.349), 1993-1995, TR.

It occurs throughout lowland Britain, Europe and Asia Minor.

Epilobium ciliatum (Epilobium adenocaulon).* **American willowherb.



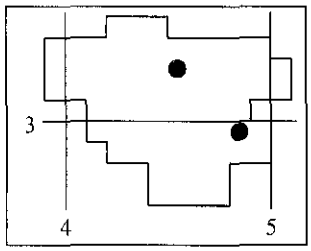
Widespread in Hall (1980) and similarly common in our survey. This is in marked contrast to the situation in Wolley-Dod (1937) who has only five records for the whole of Sussex.

Usually found on road banks and waste places. The gaps in its distribution correspond mainly to the areas of the Forest with the highest proportion of heathland. Its distribution is very similar to a number of weedy species like *Atriplex prostrata* and *Sonchus oleraceus*. Not only is it now a common species but forms a range of hybrids, indeed most of our *Epilobium* hybrid records have *E. ciliatum* as one of the parents.

Preston (1986) reviewed the records for this species and noted that, although it was first collected in Britain in 1891, it was not recognised until the 1930s. The first description was published in 1935, and after that it was found more widely, reaching Wales by 1942, Scotland by 1957 and Ireland by 1958. The colonisation seems to have been by continuous spread in contrast to that of *Senecio squalidus*.

A native of North America, well established in south-east England and spreading (Rich & Woodruff 1996).

Epilobium palustre. **Marsh willowherb.**



Coleman's Hatch, H. S. Salt (Wolley-Dod (1937). Tetrads 42T, 43K and 43V (Hall 1980).

We have only two records from our survey. The first is from a flush at Newbridge (457.325) close to the site of *Galium uliginosum* where several plants were found growing in a mat of *Hydrocotyle vulgaris* by AK and AH in August 1994. The second record is for a single plant found in a rushy flush in unimproved pasture at Brown Knoll (487.299) during one of the Flora meetings in 1995.

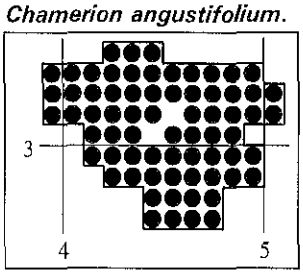
Epilobium palustre is a calcifuge. It occurs in wet places throughout Britain and is scattered thinly throughout much of East and West Sussex. Locally common throughout Britain and widespread in Europe, Asia, North America and Greenland.

It can be confused with other *Epilobium* species, especially *E. obscurum* from which it can be distinguished by the complete absence of raised ridges on the stem and the presence of a short appendage at the hairy end of the seed, a feature which is clearly illustrated in Stace (1991).

Epilobium brunnescens.* **New Zealand willowherb.

Hall (1980) shows it in tetrads, 42N and 43H but it was not found during our survey, which is perhaps surprising as this introduction from New Zealand is still spreading in Britain. It is most common in the north and west and may be climatically limited in the south-east.

Chamerion angustifolium. **Rosebay willowherb, Fireweed.**



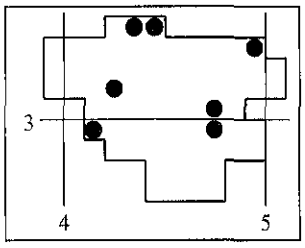
Almost ubiquitous in our survey, as it was in Hall (1980) and Wolley-Dod (1937). A native plant once mostly of rocky gullies in northern Britain, now widespread everywhere. The spread is attributed to the creation of suitable ground such as railway banks and road sides, and studies have shown that it is not the result of an alien genotype being naturalized as is often thought (Myerscough 1980). Coleman (1836) only gave one site at Plaw Wood, where it still occurs today. By the time Arnold published his flora in 1887 it was still uncommon as individual records are given (none of which are from the Flora area). Since then it has become one of our most familiar wild plants with its showy flower spikes brightening a range of open

habitats.

It lives up to the name of fireweed on the Forest, often appearing in large numbers where areas of heathland or road verge have been burned. It is a species which requires high light levels and nutrients, and hence is often found with *Urtica* and *Rubus*. Where secondary woodland develops around patches, the rosebay will survive but flowers sparingly and produces little or no seed.

Widespread and common in most of Britain, Europe, Asia and North America.

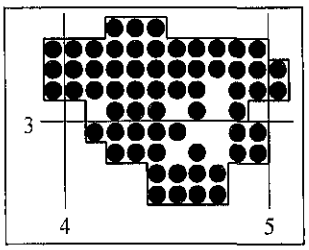
Oenothera glazioviana (Oenothera erythrosepala). **Large-flowered evening-primrose.**



Oenothera is a large, critical genus with many species. In Britain this is the commonest of them with large flowers. The seven records scattered across the area indicate a slight increase in the frequency since Hall (1980) who shows it in tetrads 42N, 42T and 43L, none of which correspond to our records. Our records are from waste places and car parks which are the typical habitat of this plant.

O. glazioviana is an introduction from North America which is now a familiar sight on roadsides and waste places in much of Britain except for some areas of Scotland. Locally common in west and central Europe.

Circaea lutetiana. **Enchanter's-nightshade.**



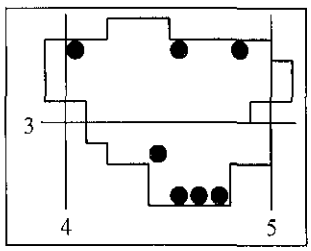
Common in Hall (1980) and almost ubiquitous in our survey.

Circaea has the distinction of being the only genus native to Britain with only 2 petals in its flowers. It is a plant of moist shady habitats, mainly found in woodland where it can be present in large numbers. This habitat preference, together with the fact that it does not occur in the more acidic areas, probably explains its absence from 1-km squares 45.28, 46.29 and the band stretching from 47.28 to 47.31 which are mainly heathland. It is also a hedgerow plant, and may invade gardens from surrounding hedges.

Widespread in Britain with the exception of northern Scotland and in Europe from Denmark southwards, and east to central Asia and North Africa.

CORNACEAE

Cornus sanguinea. **Dogwood.**

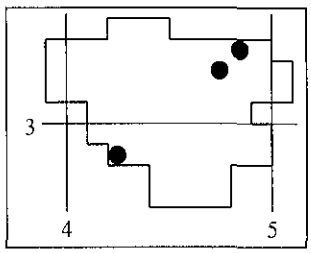


Tetrads 42N, 42P and 42T on the south side of the Forest (Hall 1980).

Scattered around the edges of the Forest on the more calcareous clays, and especially in the Toll Lane - Cackle Street area. This matches its distribution in Sussex where it is common except on the acidic soils. Similarly it is widespread in southern lowland England, eastern Wales and in Europe south of the Baltic. In the north of Britain fruit-set is uncommon except in warm years and it seems restricted to old woodlands and hedges - in the south it is a rapid colonist of open ground.

It is unlikely that this species was used in the production of charcoal as *Frangula alnus* was also called 'dogwood' in Sussex, and produced very good charcoal (*AFN* 30:13-14).

Cornus sericea. **Red-osier dogwood.**

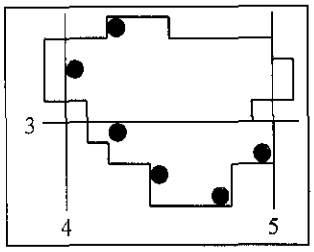


Planted in Maskett's Wood (428.285), 1995, TR *et.al.*; at entrance to Wrens Warren but not spreading (471.326), 1995, PW; at entrance to Rooks Lodge (485.335), 1995, PW.

Probably not naturalized properly in Sussex, but known to be elsewhere in Britain and Ireland and potentially a significant weed of wetlands with eutrophic soils (Kelly 1990). Native in North America.

CELASTRACEAE

Euonymus europaeus. **Spindle.**



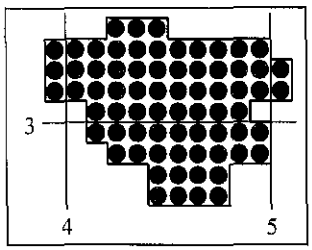
Tetrads 33V, 43A and 43F (Hall 1980).

Very locally distributed around the Forest usually as scattered, isolated bushes and, like *Cornus sanguinea,* on the more calcareous soils. A row of large bushes between the entrances to Hindleap car park (404.324) are generally left when the sight-lines are trimmed, though some sucker naturally, DK. This Hindleap site is not on the clay and were it not for the high pH on the roadside (pH 7.7), Hall's records for tetrads 43A and 43F would look distinctly suspect; we have not refound it in 43F.

Common in southern England on base-rich soils, and in the north of England more restricted to limestone soils. Widespread in middle Europe. Caucasus and western Asia.

AQUIFOLIACEAE

Ilex aquifolium. **Holly, Christmas, Holm.**



"Ashdown Forest was anciently covered with it; little now remains except a dense thicket near Leg's Heath Gate" (Coleman 1836).

By contrast, we have recorded it in every square, no doubt spreading as a result of relaxed grazing pressure and obviously suited to the damp, acidic soils. It is locally abundant in woodland, often as saplings under trees where birds have voided seeds, with a few larger trees. In some woods, such as Kidbrooke Wood (416.335), small saplings and bushes less than one metre tall are abundant and are so heavily browsed by deer they cannot grow any taller. Rabbits may also eat them from below to about 30 cm from the ground leaving a distinct cut-off line. Holly can also be quite frequent as a heathland colonist, as for instance around Gills Lap (465.320) where the bushes have been coppiced by fire. It is also abundant in hedges around the Forest, and was one of the major hedging species. There are good holly hedges along the lane at Shepherd's Gate (448.336) and Cackle Street (452.265), and it was traditional to leave holly standards in hedges uncut to prevent witches flying up and down them and bringing bad luck! Holly Hill, Hollycroft and Beggars Bush (begar = berry, so holly bush) are local names.

At one time cut branches were supplied to the wild deer herds as food during hard winters. Permits are still issued for berried and black holly to be cut from specific trees for wreaths, crosses and other Christmas decorations. Even in the early 1990s lorry-loads were sent from Horney Common to the London and Brighton markets.

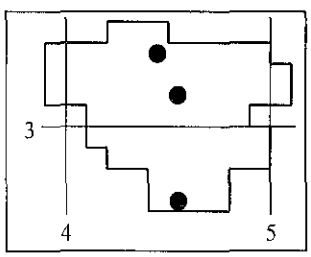
Only the female trees have berries. PW counted trees over 5 feet tall in Broadstone Warren in November 1995 and found only 10 out of 41 (24%) were female; most were along the boundary so the imbalance could be a result of planting, but casual observation suggests this may be representative of the local situation. It matches a similar pattern found in northern Britain by Richards (1988), though it is better to count trees in flower rather than fruit. Many berries remained uneaten on the open Forest in the winter of 1995/1996, even in March.

Winter cold, particularly frost, causes physical damage to hollies. Holly is abundant in western and southern Europe, but becomes increasingly rare eastwards. At the eastern limit of its distribution in Poland it is restricted to woodland and the bushes are about the same height as the winter snow, which gives them some protection from the cold. This eastern limit correlates with the mean -0.5°C isotherm for the coldest month in the winter (extreme nights may be 20°C colder than the mean). Laboratory tests on holly show that frost damage begins to occur in the xylem and phloem when leaves and small twigs are frozen to -12°C. Depending on hardening, with increasing cold, larger twigs and eventually whole bushes may be killed. If frosts are frequent and severe, the holly cannot survive the continual damage and dies except where sheltered.

Ubiquitous in Sussex, and common and widespread in Britain, south and central Europe.

BUXACEAE

Buxus sempervirens. **Box.**

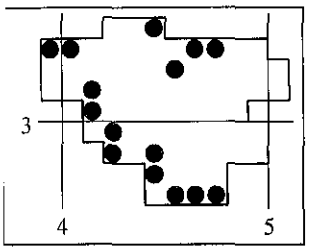


Probably planted in all localities and not naturalized. Pippingford Park (45.31), 1995, Flora meeting; hedges along the lane at Shepherd's Gate (448.336), 1995, TR; hedge west of farm, Toll Lane (459.263), 1995, TR; also planted in various churchyards.

This is a native species of chalk scrub and woodland in Britain, western Europe and the mountains of North Africa.

EUPHORBIACEAE

Mercurialis perennis. **Dog's mercury, Snake's-bit, Snake's victuals.**



Frequent around the Forest, but notably one of the few places in Sussex where it is not ubiquitous outside the urban areas (Hall 1980).

Most of our records are from the more calcareous soils around the edge of the Forest and in the older woodlands, but in some places it is established in secondary habitats as on the A22 road embankment over Millbrook (442.286).

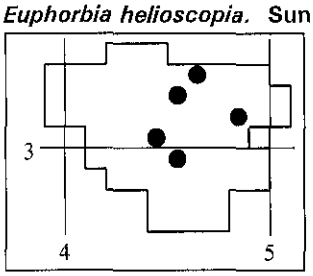
This is a rhizomatous perennial of shaded places in the lowlands on moderately to strongly calcareous, generally freely-draining soils. Brewis, Bowman & Rose (1996) note that it does not withstand trampling. It is one of the first plants to flower in the spring and is dioecious. The two sexes are reported to have different ecological requirements, the males being more commonly recorded in well-lit places and higher pH soils (Grime *et al.* 1994). Five colonies investigated in the more open parts of the Forest in spring 1996 were exclusively male, suggesting colonisation from the surrounding woods.

Widespread in Britain except in the far north and in Europe south of the Baltic, Caucasus and south-west Asia.

****Mercurialis annua.*** **Annual mercury.**

Tetrad 43V (Hall 1980). Not refound. A weed of gardens and cultivated ground usually on calcareous or nutrient-rich soils in southern Britain, but not established in the Forest. Native in Eurasia and North Africa. It is an unusual species with dioecious diploids and monoecious polyploids; to date only the former have been recorded in Britain.

Euphorbia helioscopia. **Sun spurge.**

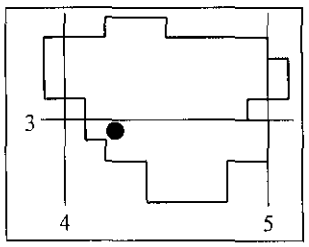


Tetrads 42E, 42T and 43H (Hall 1980).

On the Forest it is an annual weed of arable fields and gardens. It is in five scattered squares and is especially associated with the villages.

In Sussex widespread on the chalk in arable land, and similarly widespread in lowland Britain, Europe and central Asia.

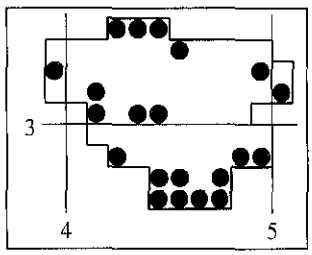
****Euphorbia lathyris.*** **Caper spurge.**



Recorded once as an escape from cultivation outside houses at Streeter's Rough (423.292), 1993, TR. It was once planted on the green in front of Duddleswell tea rooms as a mole deterrent; the plants have gone but the moles obviously still like the local food source.

A garden weed scattered in Sussex and increasing in England (Rich & Woodruff 1996). Probably native in east and central Mediterranean region.

Euphorbia peplus. **Petty spurge.**

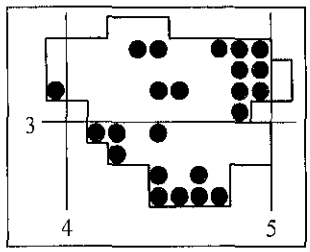


Common around the Forest (Hall 1980).

We have also found it common around the Forest edges, the exceptions being two sites on soil introduced to Pippingford Park. It is much more frequent as an arable weed in the villages than *E. helioscopia*, possibly because it has broader soil requirements, which may also explain its wider distribution in Britain.

Widespread in lowland Britain and Europe to Siberia.

Euphorbia amygdaloides. **Wood spurge.**



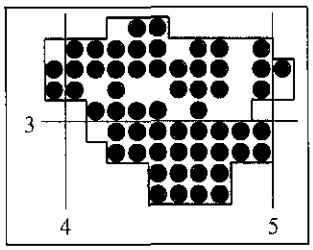
Frequent around the Forest (Hall 1980).

Our records largely match the pattern in Hall (1980) where it occurs around the Forest edges with a few records in the middle. It is most frequent in the Toll Lane woodlands where the soils are more calcareous clays, but is also surprisingly frequent in parts of Pippingford Park. It seems to be largely uneaten by deer.

This is a classic plant of coppiced woodlands on moderately to strongly calcareous soils, and is quite widespread in Sussex. It is locally frequent in southern Britain north to the Midlands, and in central, southern and north-western Europe, the Caucasus and the Algerian mountains.

RHAMNACEAE

Frangula alnus (Rhamnus frangula). **Alder buckthorn, Dogwood.**



Ashdown Forest (Coleman 1836). Common on the Forest (Hall 1980).

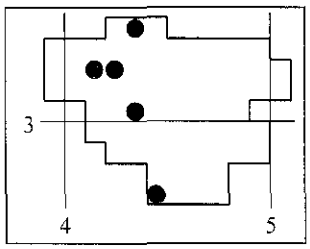
On open heath and woodland across the Forest, sometimes locally abundant, as for instance south of Chelwood Gate cricket pitch or around Jumper's Town. It can withstand shade and occurs as scattered plants in closed secondary woodland where it fruits only sparsely. The mixture of black and red berries as they ripen is often striking.

This species produces a high grade charcoal which is light and flammable, and especially suitable for making gunpowder and time fuses. It was planted and coppiced specifically for gunpowder in some places in Britain, and it is still commercially harvested in Europe (Howkins 1994). 'Dogwood' was historically collected from the Forest and taken to 'Dogwood Yard' at Fairwarp. Bark was stripped from bundles of sticks after soaking in the pond, and then dried before being sent to gunpowder factories at Faversham, Maresfield and other places (*AFN* 30:13-14). The bark is also useful medicinally (Howkins 1994).

Locally common on acidic soils in the Weald, and especially frequent on Ashdown and St Leonard's Forests. Locally frequent in England and Wales on acidic soils, but decreasing (Rich & Woodruff 1996). Widespread in middle Europe to Siberia, and in North Africa.

LINACEAE

****Linum usitatissimum.*** **Flax.**

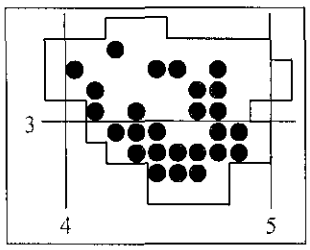


Occasional as regularly spaced plants scattered on road verges, and in drains, whence they arrived off the back of seed lorries. The short, oil-seed plants are also rarely grown for linseed in the Flora area, as for instance near Monkshill Farm (394.339) in 1995, but all the records are from roadsides. Numerous seedlings have been noticed germinating in September in road gutters, but few survive to flowering.

Flax fields often appear blue in the morning and green in the afternoon, which is probably either due to flowers tracking the sun, or the petals dropping as the flowers only last a day.

Flax was once quite widely grown for linen and linseed oil up to the first world war. A flax factory was built during World War II at Five Ash Down, and produced webbing, etc. Historically seed was imported from eastern Europe, resulting in the occurrence of some unusual weeds specific to flax fields which had evolved to resemble flax (e.g. *Camelina* spp.; Rich 1991). The modern resurgence of growing flax for linseed subsidies has not resulted in the re-appearance of any interesting weeds as the seed is cleansed of impurities.

Linum catharticum. **Fairy flax.**



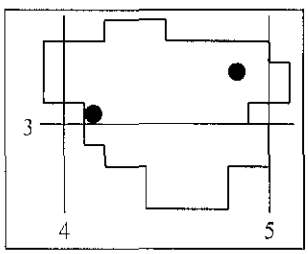
Frequent on the Forest (Hall 1980).

Our distribution map shows a pattern strongly related to the richer road verges which presumably have a calcareous influence from the road chippings. It also occasionally occurs in open, damp, base-rich areas in grassland, and may occur on rides.

Common on the chalk in Sussex and locally frequent elsewhere (Hall 1980); it is widespread throughout Britain but decreasing in England probably due to habitat loss (Rich & Woodruff 1996). Widespread in Europe and western Asia.

This slender plant behaves as an annual or biennial, the former producing about three times fewer seeds than the latter. Seeds germinate mainly in the spring, and seedlings survive best in open grassland in microhabitats with some cover provided by perennial plants. It is most frequent on soils above pH 7, and has not been recorded on soils below pH 5 (Grime *et al.* 1988).

Radiola linoides. **Allseed, Flax-seed.**



On Ashdown Forest and elsewhere in abundance (Forster 1816). On Ashdown Forest (Coleman 1836). Ashdown Forest, W. C. Unwin (Arnold 1887). Frequent in Broadstone Warren, 1948, R. A. Boniface.

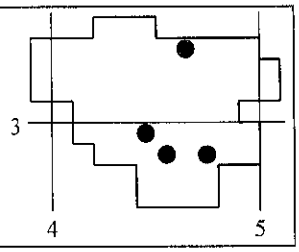
Despite the apparent abundance on the Forest in former times it was not recorded on the Forest for the *Sussex Plant Atlas* (Hall 1980). We have recorded it in only two sites; Press Ridge Warren (412.308) with *Wahlenbergia*, 1987, MM, but now gone as the site has grown over; Five Hundred Acre Wood on ride (489.327), 1994, ER & RN.

This calcifuge species is also decreasing in England (Rich & Woodruff 1996). It occurs in damp mud in wheel ruts and woodland rides and varies enormously in abundance from year to year. It is often associated with *Anagallis minima* but has a wider distribution in Britain which Salisbury (1970) suggests is due to its three-fold greater potential seed output.

Although one of Britain's tiniest plants and thus easily overlooked, it does seem to be becoming rarer. It is now only ocally frequent in Britain in the Weald, the Surrey heaths and the New Forest, and very scattered near the coasts lsewhere. Mainly western in Europe, and in temperate Asia and Africa.

POLYGALACEAE

***Polygala vulgaris*. Common milkwort.**



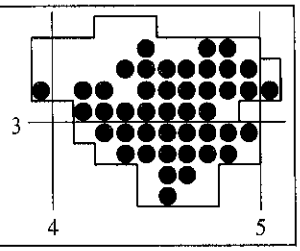
Nine tetrad records from the Forest in Hall (1980), but we do not believe them all!

This species usually occurs in moderately to strongly calcareous soils (pH 5-8, Grime *et al*. 1988) and the Forest is generally quite unsuitable for it. Our records have all been checked carefully and are as follows: meadow at Pippingford Park (449.298), 1995, TR; verge at Marlpits (454.288), 1995, Flora meeting; Marsh Green (46.33), 1994, SBRS; verge by Radio Station (474.287), pH 7.4, 1994, Flora meeting.

Widespread on the chalk in Sussex but in the light of our experience possibly somewhat over-recorded elsewhere? Widespread in Britain predominantly on calcareous soils, and decreasing in England probably due to habitat loss (Rich & Woodruff 1996). Widespread in western Europe. We have not investigated which of the two subspecies occur.

This species has all lower leaves alternate; *P. serpyllifolia* has at least some opposite pairs but they often drop off early so examine the position of the nodes if in doubt (Rich & Rich 1988).

***Polygala serpyllifolia*. Heath milkwort.**



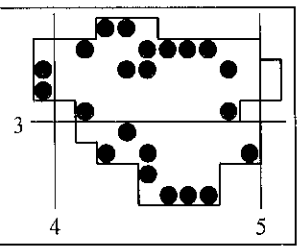
Ashdown Forest, 1893, T. Hilton (**BTN**). Frequent on the Forest (Hall 1980).

Our distribution maps shows it widespread on the southern slopes where there is open heathland and grassland. The small blue flowers are noticeable in May when the vegetation is open, but they are present all summer.

In Sussex locally frequent in acidic grasslands and on heaths. In Britain most frequent in the north and west, but scattered throughout. Strongly western in Europe, and in Greenland.

HIPPOCASTANACEAE

***Aesculus hippocastanum*. Horse-chestnut.**



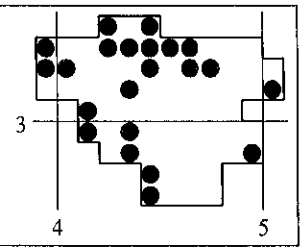
Common in Sussex and on the Forest (Hall 1980).

We have recorded it most frequently around the Forest on the richer soils and in the villages. Many trees must have been planted but it does regenerate commonly by itself. Widely established in Britain. Native in south-eastern Europe.

The conker crop in 1995 was very poor, probably due to the dry summer. The trees used for the National Conker championships similarly only produced about 30 conkers from 200 trees.

ACERACEAE

***Acer platanoides*. Norway maple.**



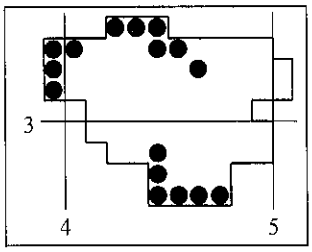
Four tetrads on the west side of the Forest (Hall 1980).

Surprisingly frequent in some places, for instance from the Ridge Road to near Stone Cottage (44.32, 44.33, 45,33), 1995, PW, or north-west of Nutley (43.28), 1995, TR & MM. Recorded around the edge of the Forest, mainly associated with houses but often naturalized away from them.

Scattered in Sussex and increasingly recorded as naturalized in England (Rich & Woodruff 1996). Native in Europe from eastern France to Asia.

A concrete post by the Radio Station has the impression of a maple leaf, the work of Canadian soldiers present during the war (*AFN* 29; 15).

***Acer campestre*. Field maple.**

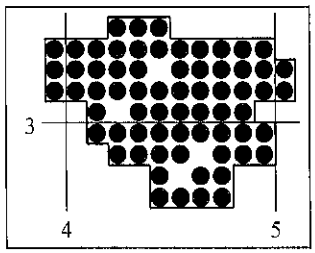


Common on the Forest (Hall 1980).

Mainly recorded around the edge of the Forest on the richer clays in hedges, and sometimes also planted on boundaries. We have not re-recorded it in five of Hall's tetrads.

Native and widespread in lowland Britain north to Cumbria and Durham. Widespread in Europe south of the Baltic though rare in the Mediterranean, and in western Asia.

****Acer pseudoplatanus*. Sycamore.**



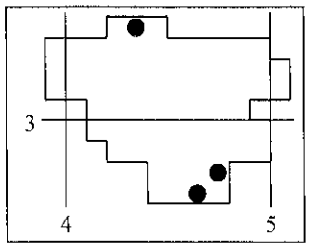
Recorded in 90% of the tetrads in Sussex (Hall 1980).

We have recorded it in most of the squares but it is rarely abundant. Widespread and increasing in Britain (Rich & Woodruff 1996).

Native in south-east and central Europe and Asia west to eastern France, and had the English Channel not flooded it would surely have reached Britain by itself. It was first recorded in the fifteenth century, and is now so well established it gives the appearance of being native and is probably the fifth commonest broad-leaved tree. Pigott (1984) noted that in Britain it tends to only occur at high frequency in woodland canopies in the north and west where the climate is wetter (30 inches or more of rain a year), which matches its behaviour in Europe where it occurs in the hills in the Ardennes, Vosges, Black Forest and Alps, and is rare in the drier northern parts of France. Interestingly, this was one of the trees on the Forest most hit by drought in 1995 when a number of younger trees were killed off.

OXALIDACEAE

****Oxalis corniculata*. Procumbent yellow-sorrel.**

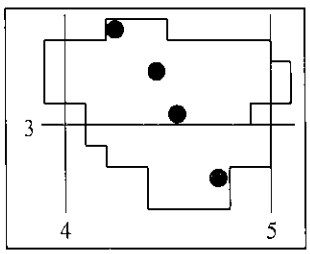


Garden weed, Forest Row (43.34), 1995, PW, TR; Fairwarp (46.26), 1995, PD & RN; Oldlands Hall (47.27), 1995, PD *et al*. Usually a weed in gardens, waste ground and dumped soil.

Scattered in Sussex, and in southern Britain where it was first recorded in 1585. It is widespread throughout the world as a weed.

This species has yellow flowers mostly with ten fertile stamens. It creeps and roots at the nodes, and is often flushed purple. Reid (1975) noted that its flowers opened an hour earlier and shut an hour earlier than those of *O. exilis*.

****Oxalis exilis*. Least yellow-sorrel.**

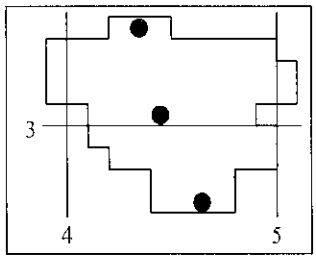


Garden weed, Forest Row (426.349), 1995, TR; dumped soil with garden plants in woodland outside houses at The Ridge (448.329), 1995, TR & PA; side of track, Pippingford Park (45.30), 1993, SBRS; Oldlands Hall (47.27), 1995, PD *et al*.

Occasional in Sussex and Britain, and increasing (Rich & Woodruff 1996). Native in Australasia.

Like the above species, a weed, but smaller in all its parts and usually with five fertile stamens (Reid 1975).

****Oxalis stricta (O. europaea)*. Upright yellow-sorrel.**

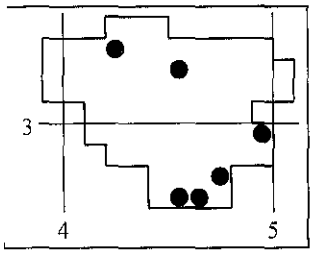


Forest Row (43.34), 1995, TR; probably this species near Home Farm (443.304), 1993, TR & PD; Fairwarp (46.26), 1995, TR.

Another garden weed of waste ground occasionally established in Sussex and Britain. It has small yellow flowers and grows upright but does not root at the nodes. Native in Eastern Asia and North America.

Stace (1991) clarifies that the Dillenius' oxalis ('*O. stricta*') in Hall (1980) should be called *O. dillenii*.

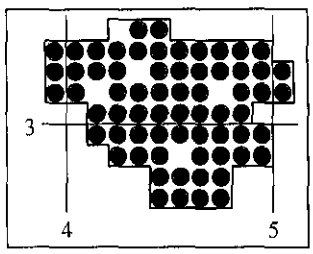
Oxalis articulata. **Pink-sorrel.**



Occasionally recorded scattered around the Forest, the common weedy pink sorrel in gardens, for instance as a garden escape near Brown's Brook (472.278), 1994, Flora meeting, and naturalized in flower-beds at Oldlands Hall (475.275), 1995, PD *et al.*

Increasingly recorded in England (Rich & Woodruff 1996). Native in eastern South America.

Oxalis acetosella. **Wood-sorrel, Cuckoo's meat, Cuckoo-sorrel.**



Recorded in every tetrad on the Forest (Hall 1980).

We have recorded it in all but five squares, though it is not common. Plants with pink flowers were noted at Newbridge, 1987, PW. It is widespread in Britain on many soil types, mainly in woodlands but also in the open where not droughted (Packham 1978). It is widespread in the northern hemisphere.

Wood sorrel is one of the best adapted woodland plants. It is evergreen and its ability to grow through the winter enables it to survive in quite deep shade. In this habitat the leaves are very thin, spreading the tissue to catch as much light as possible (Packham & Willis 1977). Such leaves may over-heat when caught by sun-spots on the woodland floor, so it has a clever mechanism to avoid damage; the leaves droop rapidly and move out of the way (this phenomenon was first investigated by Bjorkman & Powles (1981) on a close relative *O. oregana* which grows in giant redwood forests in North America). The movement is caused by specialised cells in the pulvinus (the junction between the leaflet and the stalk) which alter their size hydraulically. Experiments with *O. acetosella* by TR have demonstrated that when too much light is detected in the pulvinus the leaves can droop within 6 minutes in bright light, and 15 minutes in duller light. If the light is focused on the leaves but not the pulvinus it cannot be detected, and it is possible to give them enough light to bleach the chlorophyll without the leaves drooping. The response is initiated by blue but not by red light. When the light is removed the leaves take 30-45 minutes to move horizontal again. Young leaves respond faster than old leaves, and adjacent leaflets can act completely independently. The leaves also droop at night, a separate response called nyctinasty; Darwin (1882) demonstrated that it prevented radiation frost damage at night.

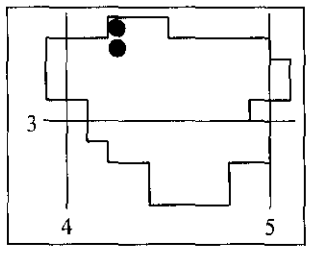
Wood sorrel flowers freely in May, and the rest of the summer produces cleistogamous flowers which produce just as many seeds. The capsules dehisce explosively ejecting the seeds a metre or more from the parent.

GERANIACEAE

Geranium.

Many species are grown in gardens and become established for short period of time in the wild - one plant collected near a garden at Crowborough (506.322), 1994, PW was not identifiable, and there is one record of **G. macrorrhizum,* 1994, ER (det. PW).

****Geranium endressii.*** **French crane's-bill.**

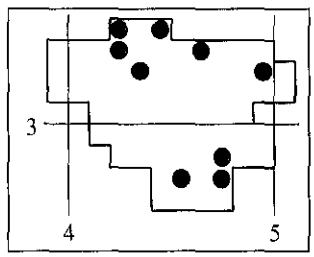


Tetrad 53A (Hall 1980).

Two records from Forest Row as garden escapes by houses (one may even have been planted), one growing with the following species. The flowers get paler as the season progresses.

Locally naturalized in Britain. Native in the Pyrenees.

Geranium* × *oxonianum (G. endressii* × *versicolor). **Druce's crane's-bill.**



We have recorded this more frequently than *G. endressii*, and it seems to be more commonly grown in gardens locally and is available in the garden centres. The plants are garden throw-outs or occasionally spread under their own steam (they are at least partly fertile).

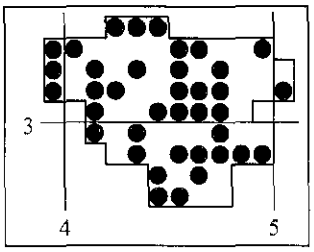
This hybrid has long been confused with its parents, and we hope we have recorded them correctly because the commonest taxon nationally is supposed to be *G. endressii*. The plants have pale pink flowers sometimes with deeper veins, and are often variable on the same plant (Stace 1991). Plants sold locally as *Geranium* 'Claridge Druce' in garden centres are not pale pink or variable on the same plant.

It originated in cultivation, and is also naturalized elsewhere in Britain.

Geranium versicolor. **Pencilled crane's-bill.**
Near Forest Row, Miss Parsons (Wolley-Dod 1937). Not recorded again, and possibly confused with one of the above? Plants with white or nearly so petals and magenta veins should be examined carefully. Native in southern Europe.

[***Geranium sanguineum.*** **Bloody crane's-bill.**
Between Maresfield and Nutley, 1901, S. Morris (Wolley-Dod 1937). Recorded once as a garden throw-out on Posthorn Lane, Forest Row (43.34) 1993, TR, but gone by 1994 and not really naturalized.]

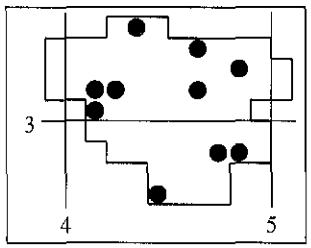
Geranium dissectum. **Cut-leaved crane's-bill.**



Frequent on the road verges and in open pastures and meadows except where grazed. After the summer drought of 1995, the autumn germination was prodigious and some roadside banks had sheets of young plants. Roadsides are a very typical habitat where it flowers early and avoids being mown before fruiting.

Recorded in 90% of the Sussex tetrads (Hall 1980). Widespread in lowland Britain and Europe south of the Baltic.

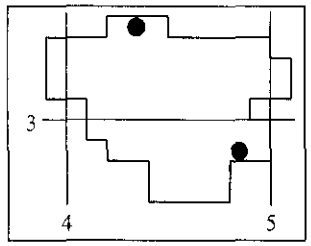
Geranium molle. **Dove's-foot crane's-bill.**



Tetrads 42T, 43M and 53A (Hall 1980).

We have recorded it a little more widely than Hall, usually with *G. dissectum* nearby. In Sussex it is common except on the heavier soils, and is widespread in lowland Britain and in Europe mostly south of the Baltic. It is also found in south-west Asia to the Himalaya and North Africa.

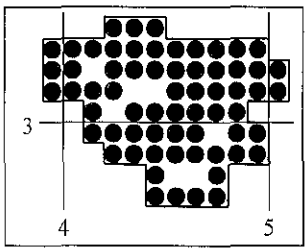
Geranium lucidum. **Shining crane's-bill.**



Bridge over railway, Forest Row (438.347), 1995, TR; drive to Barnsgate Manor (48.28), 1995, RN & ER.

A rare scattered plant in Sussex, probably usually as an escape from cultivation and not native on the Forest. Probably native on chalk and limestone in the west of Britain, and widespread in Europe. It is also found in south-west Asia to the Himalaya and North Africa.

Geranium robertianum. **Herb Robert, Bachelor's buttons, Little bachelor's buttons, Stinking Bob.**



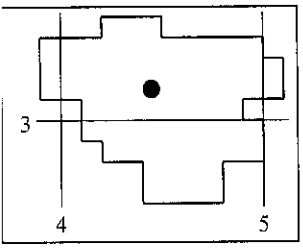
Frequent on the richer soils, often on road verges and on the edges of woods. White-flowered plants were recorded along the stream at Cow Field (495.317), 1995, Flora meeting.

Ubiquitous in Sussex (Hall 1980). Widespread in Britain but decreasing in England (Rich & Woodruff 1996), and widespread in Europe and Asia. It has a broad ecological range from shingle beaches to dense woodland, and is most abundant on calcareous soils.

Geranium phaeum. **Dusky crane's-bill.**
Tetrad 43A (Hall 1980), not refound.

Locally established in Britain, and decreasing in England (Rich & Woodruff 1996). Native in damp shady places in southern and central Europe.

***Erodium cicutarium.* Common stork's-bill, Hemlock stork's-bill.**



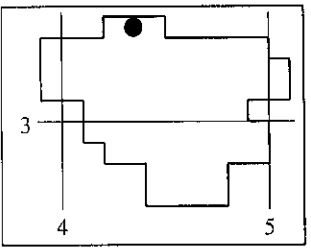
Tetrad 42N (Hall 1980).

Rough track near Centre Bridge, Pippingford Park (449.316), 1995, SBRS, presumably fallen off the wheels of an army lorry.

Widespread inland in southern Britain (but decreasing Rich & Woodruff 1996) on sandy soils, becoming increasingly confined to the coast in the north. Widespread in Europe but probably native only in the south and west, temperate Asia and North Africa.

TROPAEOLACEAE

***Tropaeolum majus.* Nasturtium.**

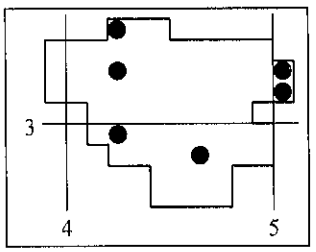


A garden escape on dumped soil, Forest Row (434.343), 1994, TR & NM, but not persistent. There is no record of the fate of 'nastershalums' planted around the Forest in Winnie-the-Pooh.

Increasingly recorded in England (Rich & Woodruff 1996). Native in the Andes.

BALSAMINACEAE

***Impatiens parviflora.* Small balsam.**

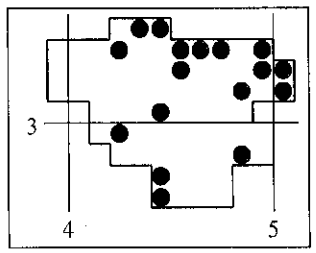


Tetrads 43M and 43W (Hall 1980). Tetrads 33V and 43V (Briggs 1990).

We have recorded it in seven scattered squares, and it is possibly still spreading. It is usually found in disturbed, nutrient-rich, damp places in the open or in more natural conditions in woodland on stream banks.

It is probably best established in the Weald in Britain where it is abundant in some woodlands and along river banks, and it also well established in some urban areas such as London. As a native it occurs on river and stream sides, ravines, stony mountain slopes and shady, moist places in central Asia matching to some extent the habitats in which it is naturalized in Britain. It is extensively naturalized in eastern, central and northern Europe. It may have been introduced with buckwheat for pheasant food or with rooted trees and shrubs (Coombe 1956).

***Impatiens glandulifera.* Indian balsam, Policeman's helmet.**



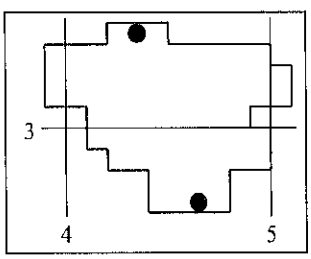
Four tetrads around the Forest (Hall 1980).

Now well established in our Flora area along riversides, and sometimes on waste ground.

First introduced to Britain in 1848, and now widespread and still increasing along rivers and streams. It is well adapted to the river-bank habitat, and grows rapidly on the damp nutrient-rich soils, often forming dense stands which exclude other species. It is shade-tolerant though it flowers less profusely in woodland. The seeds require a chilling treatment so they germinate in the spring after the winter floods, and the plants are tolerant of flooding and silt deposition. The fruits dehisce explosively to scatter the seeds locally, and they are more widely spread by water along the rivers; it now occurs along most major water courses in Britain. It is native in the Himalaya, and may be somewhat frost-sensitive.

ARALIACEAE

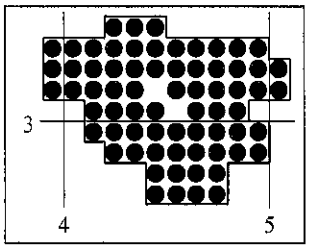
***Hedera colchica.* Persian ivy.**



Large patch climbing trees outside garden, Forest Row (432.344), 1993, TR and still there in quantity in 1995, PW; by Fairwarp Village Hall (467.263), 1995, TR.

Occasionally established in Britain. Native from the Balkans to Caucasus.

***Hedera helix* subsp. *helix*. Common ivy.**

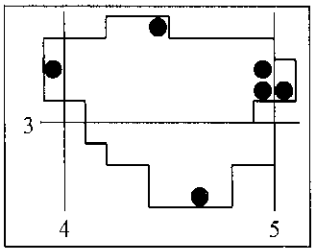


Ubiquitous in Sussex (Hall 1980) and nearly so on the Forest, widespread in Britain and mainly western in Europe. It also occurs in Asia Minor and Iran.

Ivy tends to be a typical colonist of secondary woodland but is palatable, and has probably spread on the Forest following the removal of grazing animals. It is one of the few species to start flowering in the autumn, but tends to do so only in well-lit places. The seeds are spread by birds.

There is little evidence that ivy climbing up trees significantly affects them. Entomologists regard ivy as an important nectar source which also provides winter shelter for many species, and think its removal from trees is an inexcusable act of vandalism (Kirby 1992)! The second brood of the holly blue butterfly feeds on ivy on the Forest. It also provides shelter for birds and bats.

***Hedera helix* subsp. *hibernica*. Atlantic ivy.**



Scattered around the Forest in hedges and woodland, almost always near houses but sometimes locally abundant and swamping the local vegetation (e.g. large patches established on wood edge east of Fairwarp Village Hall (467.263), 1995, TR & G. M. Kay).

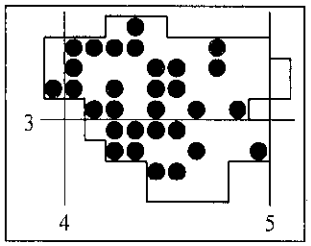
Often treated as a distinct species rather than a subspecies of *H. helix* (McAllister & Rutherford 1990); in addition to the larger, broadly lobed leaves, it smells fetid and the rays of the hairs on the leaves project in all directions (appressed in subsp. *helix*).

As a native it is mainly western in Britain, but is widely planted. It is thought to be somewhat frost-sensitive and is most often naturalized in the west, so our Wealden records may match the pattern shown by other Atlantic species.

APIACEAE (UMBELLIFERAE)

The best guide for identification of this family is the BSBI Umbellifer handbook (Tutin 1980).

***Hydrocotyle vulgaris*. Marsh pennywort.**

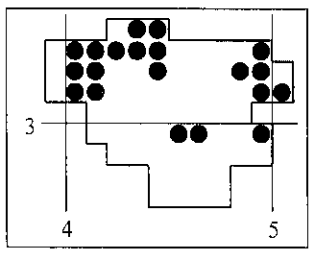


Bogs on Ashdown Forest (Coleman 1836). Ashdown Forest, 1895, T. Hilton (**BTN**). Frequent on the Forest (Hall 1980).

We have recorded it scattered in flushes and wet grassland mainly in the open central areas of the Forest. It creeps and forms patches amongst other vegetation where the flowers and fruits are well-hidden. It readily colonises wet, disturbed areas, but does not tolerate woodland shade.

In Sussex, locally frequent on acid or peaty soil (Hall 1980); Grime *et al.* (1988) note it occurs on soils of pH 4.5-6.0. Widespread in Britain but commoner in the west, and decreasing (Rich & Woodruff 1996). Widespread in west, central and southern Europe.

***Sanicula europaea*. Sanicle.**



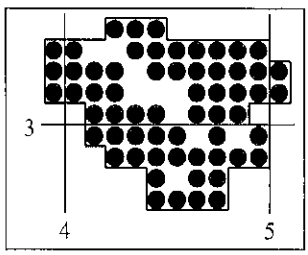
Frequent around the Forest (Hall 1980).

An evergreen species usually recorded from the edges of tracks and paths or roadsides (e.g. around Wych Cross) on exposed banks and probably on the more base-rich soils, and sometimes also on the richer soils along the streams, as near Old Lodge. Surprisingly we have not recorded it on the south side of the Forest, where it was recorded in the *Sussex Plant Atlas* and should occur.

Grime *et al.* (1988) note it occurs on soils above pH 4.5, is most frequent on calcareous soils above pH 6.0, and that it is very shade-tolerant. Inghe & Tamm (1985) in Sweden found that juvenile plants flowered first at 8-16 years old, and when they did flower they tended not to flower again the following year. There was low mortality of established plants with a half-life of between 59 and 360 years (so some live as long as the trees above), but they were susceptible to summer drought.

Brewis, Bowman & Rose (1996) note that it usually occurs in ungrazed woods in Hampshire, and off the chalk it is a good ancient woodland indicator. Common in Sussex on basic soils, but uncommon on the acidic sands. Widespread and mainly on calcareous soils in Britain and Eurasia and parts of Africa.

***Anthriscus sylvestris*. Cow parsley, Keck, Rabbit's meat, Queen Anne's lace.**



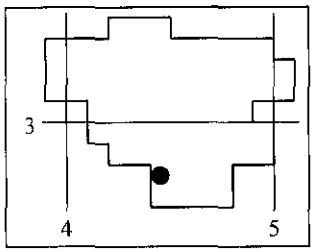
Ubiquitous in Sussex in every tetrad (Hall 1980).

We have recorded it widely around the Forest on verges, field borders and in hedges, though not in the acidic areas or where there is deep woodland.

This species is a nitrophile which can dominate vegetation in spring and early summer, lining some Sussex verges like white lace. It has probably increased in abundance in Britain as a result of fertiliser drift from fields onto road verges and into woodland edges. It is also resistant to many herbicides. Plants in southern Britain are hairy and can look very different to glabrous plants in the north. It does not appear to line verges in Europe to the same extent as in Britain.

Widespread in Europe from the shores of the arctic, the birch woods and mountain ledges of Norway to the rich grasslands of central Europe and stream and ditch-side communities, but rare in the Mediterranean (Clapham 1953). It also occurs in temperate Asia and North Africa.

***Smyrnium olusatrum.* Alexanders.**

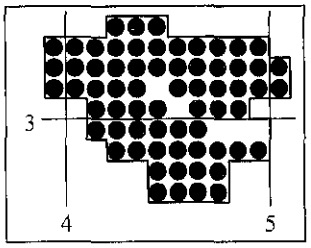


A small clump at the base of hedge, Clock House Lane, Nutley (443.277), 1994, AK & PD.

In Britain alexanders is a fully naturalized introduction, formerly used as a pot herb, whose native range in southern Europe extends to north-west France. Although very common around the coast south of a line from Liverpool to the Wash, it is distinctly scarce this far inland, with our site being one of the farthest from the coast in Sussex. It has been recorded spreading inland on road verges in recent years (e.g. Beeching Way, East Grinstead, 1994, TR).

Western Europe, south-west Asia and North Africa.

***Conopodium majus.* Pignut, Fairy potatoes.**

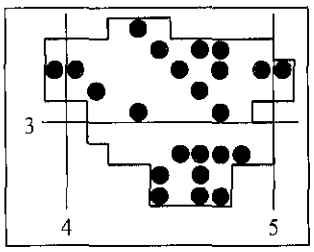


Common on the Forest (Hall 1980).

Never abundant, but quite widespread in woodland and grassland around the Forest, though not on heathland. The small tubers were eaten locally as a snack or titbit by children who up to at least the 1940s often went to school without breakfast such was the poverty (Mrs E. Vernon, Horney Common, pers. comm. to MR).

Given its general high frequency in Britain, it is surprising to find it is an endemic plant of western Europe from Norway to Italy.

***Pimpinella saxifraga.* Burnet saxifrage.**

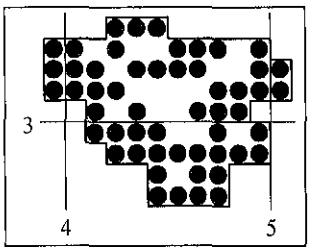


Frequent on the Forest (Hall 1980).

Very locally distributed in road verges and grassland, usually in unimproved, slightly more base-rich areas but also on more acidic, low fertility soils in older grassland. On the verges it often gets mown and the basal leaves need to be searched for carefully. With the late verge cutting in 1995 more was noticed in flower on the verges, and it is especially frequent south of Gills Lap.

Common in Sussex in dry grassy places and on the chalk. Widespread in Britain, Europe and south-west Asia.

****Aegopodium podagraria.* Ground-elder, Gout-weed, Bishop's weed.**

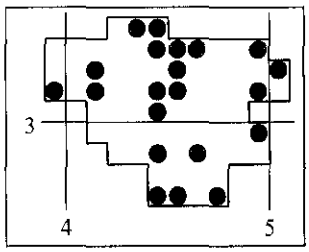


Common on roadsides and especially near houses, mainly around the edge of the Forest.

Ubiquitous in Sussex (Hall 1980) and Britain. Believed to have been grown as a medicinal plant and as a spring cure for gout since Roman times. Now one of the worst garden weeds and virtually impossible to get rid of.

Clapham (1953) considers it to be a natural constituent of deciduous woodland on base-rich soils in central and eastern Europe, where it is most prominent in moist, valley-bottom and stream woodlands. In north-west Europe it is also a typical component of the ruderal nitrophilous communities similar to those in which it occurs in Britain, and where it is obviously a weed. Also found in temperate Asia.

***Oenanthe crocata.* Hemlock water-dropwort.**



Seven tetrads on and around the Forest (Hall 1980).

Usually found by streams and rivers (as for instance scattered down the Pippingford stream) on wet soils often in sheltered, shaded places. It is tolerant of iron flushes.

Common in the Weald, usually on the clays. It has a strongly southern and western distribution in Britain and is strikingly uncommon in areas with a mean January day temperature of less than 5°C. It is also strongly western in Europe and the Mediterranean.

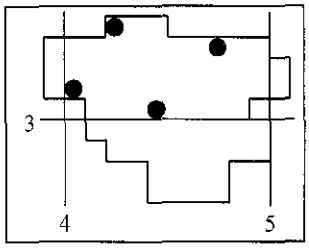
This is one of the most poisonous plants in Britain and must not be mistaken for wild celery, which does not grow on Ashdown Forest.

***Oenanthe aquatica.* Fine-leaved water-dropwort.**

Recorded in the Fairwarp tetrad 42T in Hall (1980), obviously from one of the ponds hence probably not on the Forest, but not refound possibly due to limited access. One plant was seen 2 metres outside the Flora area at 402.340, 1995, Flora meeting; this pond had been restored and the plant had presumably originated from buried seed in the mud - this has been noted at Shortwood Pond in Surrey.

Very locally frequent in Sussex. Scattered and decreasing in England (Rich & Woodruff 1996), widespread in Europe to Asia except the far north.

Aethusa cynapium. **Fool's parsley.**

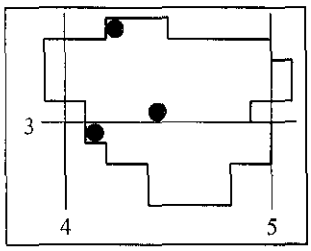


Roadside between Nutley and Crowborough, as var. *agrestis*, R. A. Boniface (Wolley-Dod 1937). Tetrads 42T and 43H (Hall 1980).

Rare as an arable weed or in gardens; 40.31, 1988, DB; three plants in disturbed flowerbed of old school (426.349), 1993, TR; introduced with soil to Pippingford Park (444.303), 1993, SBRS; Chuck Hatch (47.33), 1994, PW. It is a polymorphic species, but we have not investigated which of the subspecies occurred.

Widespread in lowland Britain, Eurasia and North Africa.

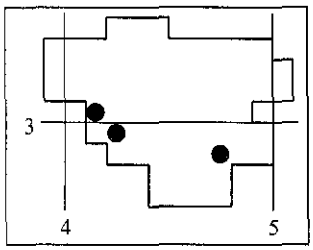
****Foeniculum vulgare.*** **Fennel.**



Chelwood Common, escaping from entrance to house (417.292), 1995, AK; Forest Row (42.34), 1995, PD & DB; introduced with soil to Pippingford Park (444.303), 1993, SBRS.

Mainly established in eastern England on verges, sand dunes and waste ground near houses, and probably a native of maritime areas in southern Europe.

Silaum silaus. **Pepper-saxifrage.**

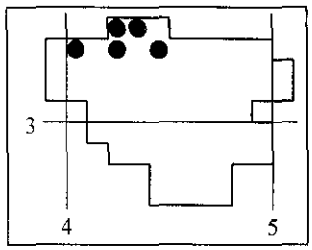


Tetrads 42N and 42T (Hall 1980).

23 plants on A275 verge north of Chelwood Gate, *c.* 30 plants (415.305), 1993, Flora meeting; one plant on track verge near Streeter's Rough (422.292), 1994, TR; verge by Radio Station (474.287), 1994, PW. Usually a plant of damp, old, unimproved, neutral meadows, but on the Forest on road and track verges.

Common on the Weald Clay in Sussex, more scattered elsewhere, and widespread in lowland England. It is a more variable plant in western, central and eastern Europe.

Conium maculatum. **Hemlock, Keck.**

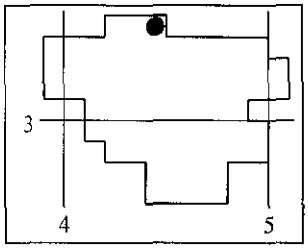


Frequent on the banks of the Medway at Forest Row outside our Flora area, but occasionally introduced with soil on the Forest though not persisting.

This is a classic nitrophile of river banks, disturbed road verges and sometimes gardens, often associated with *Urtica dioica*.

Widespread in lowland Britain and Eurasia except the far north.

Apium nodiflorum. **Fool's water-cress.**



Tetrad 43L (Hall 1980).

Only recorded once in a ditch near the pond at Lines Farm (444.344), 1995, TR.

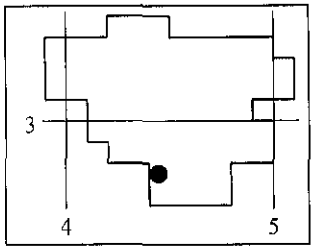
In Sussex locally frequent on the Weald Clay and in the major river valleys. Widespread in Britain, and in western, central and southern Europe, west and central Asia and North Africa.

Apium inundatum. **Lesser marshwort.**

Ashdown Forest, J. Edwards (Wolley-Dod 1937). Not refound!

Rare in Sussex, with scattered records from the nutrient-poor lakes on the sands and clays. Decreasing in England (Rich & Woodruff 1996). Endemic to Europe and very western in distribution from Sweden to Sicily.

***Sison amomum.* Stone parsley.**



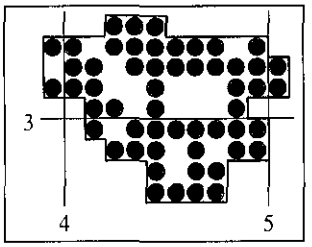
Tetrad 33V (Hall 1980), probably outside the Flora area.

One patch found by rubble on track entrance by the William IV in Nutley (445.272), pH 7.3, 1995, TR & PH, presumably introduced.

Locally abundant on the Wadhurst and Weald Clays in Sussex, and notably scarce elsewhere. Locally frequent in England south-east of a line from the Severn to the Humber, where it reaches its northern European limit. Western and southern Europe. Also present in North Africa.

[***Carum carvi.* Caraway.**
Recorded in error for *Conopodium* by Fincham (1995).]

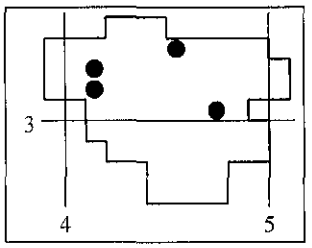
***Angelica sylvestris.* Wild angelica.**



Common on the Forest (Hall 1980).

Widespread on the Forest by rivers and stream banks, and in wet pastures and ditches, sometimes in damp, open woodland. Also very common in Sussex except on the chalk. Widespread in Britain, Europe and temperate Asia.

***Pastinaca sativa* subsp. *sylvestris.* Wild parsnip.**

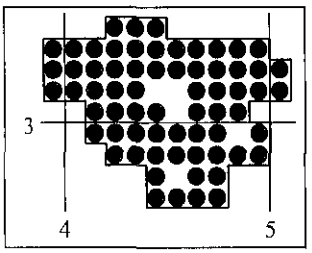


Tetrad 43A (Hall 1980) where it is still present.

Verges at Wych cross on both sides of road (417.320), pH 8.2, 1993+, AK etc.; Coleman's Hatch (45.33), 1993, TR; Kings Standing car park, presumably introduced with limestone rubble, mown and not flowering (473.301), 1995, TR & PW.

Very common in Sussex on the chalk. Common on calcareous soils in lowland Britain, and widespread in Europe except the extreme north, and in western Asia.

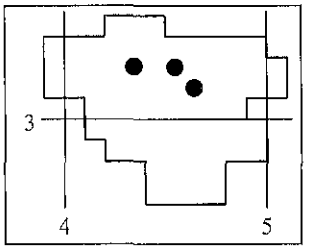
***Heracleum sphondylium* subsp. *sphondylium.* Hogweed, Cow parsnip, Rabbit's meat, Keck.**



Widespread around the Forest on irregularly mown verges and in neglected grassland, pastures and hay meadows.

Ubiquitous in every tetrad in Sussex (Hall 1980), and common and widespread in Britain, Europe, west and north Asia and western North America. A very variable plant in Europe.

***Heracleum mantegazzianum.* Giant hogweed.**

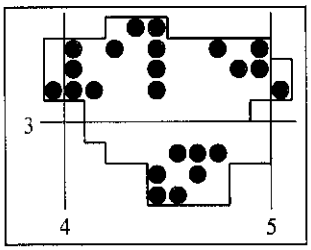


Large stand by drive at Broadstone Farm (434.328), 1986, SBRS and still present, PD; Newbridge (45.32), 1995, PW; one plant on verge outside Kidd's Hill Farm (462.318), 1995, TR and sprayed by the Forest Rangers pretty quickly

Occasionally naturalized in waste places in Sussex. Now becoming widely established along rivers and on waste ground in Britain, and sometimes also on motorway verges. Native in Asia.

This species can cause bad skin irritation when touched and subsequently exposed to bright sunlight, and is one of two species now illegal to introduce into the wild. It should be reported for eradication immediately.

***Torilis japonica*. Upright hedge-parsley.**



Common on east side of the Forest (Hall 1980).

We have recorded it scattered on roadsides, open scrub and hedges. It is very common in Sussex and widespread in Eurasia to Japan, and North Africa.

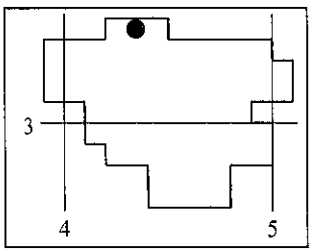
***Daucus carota*. Wild carrot.**

Tetrad 42N (Hall 1980); not refound.

Predominantly on the chalk in Sussex, but also elsewhere in the Weald (Hall 1980). Widespread in lowland Britain though becoming more coastal in the north, and in Europe south of the Baltic, temperate Asia and North Africa.

GENTIANACEAE

***Cicendia filiformis*. Yellow centaury, Slender cicendia.**



First found on the edge of the Royal Ashdown Golf Course, Forest Row (43.34), 18 July 1986, PS, when he noticed the yellow pinprick of a bud while examining *Juncus bufonius* with a lens. He returned daily for two weeks until the flowers opened in sunshine on 1 August. The colony was spread along about 17 metres of the damp edge of a sloping track and contained about 700 plants between 4 and 80 mm tall (the largest having 3 main branches) growing on bare soil and in grass at the track edge. *Drosera rotundifolia* and *Isolepis setacea* were also present but the *Isolepis* has since disappeared.

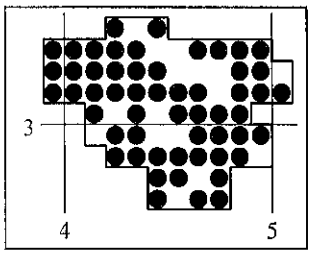
In most years the majority of the plants in the colony are extremely small, often less than 10 mm tall, accompanied by a few larger ones which may reach a height of 50 mm or more. As with other annuals, the numbers vary considerably from year to year though the small plants are extremely hard to see and make recording of exact numbers difficult. In 1987 there were around 600-1000 plants (Briggs 1990 reported 100 plants). In 1988 180 plants were recorded, in 1989 50 plants, and in 1992 70 plants (AFRR). In 1994 TR & NM found four plants, but later that summer AH found over 30. The dry spring and summer of 1995 was not conducive to growth and about 15 plants were seen by AK in July, but none could be found in August by TR. At the moment the site does not appear to be threatened although it is a little more overgrown than it was in 1986 and some management may become necessary to ensure its survival.

Cicendia filiformis is often associated with tracks, the edges of pools and ditches and occasionally occurs in damp pastures. Salisbury (1970) noted that it has occurred in certain muddy depressions year after year, sometimes in abundance, whilst being absent from apparently similar depressions nearby. The seeds germinate over an extended period in the spring, and come into flower rapidly. He found plants had an average of three capsules per plant and an average of 197 seeds in each capsule.

Cicendia is becoming scarce in the British Isles (Byfield 1994), with sites in East Sussex, Hampshire, East Dorset, Cornwall, North Devon, Dyfed, Gwynedd and the Channel Isles and can only be regarded as widespread in two areas - the New Forest and the Lizard Peninsula. Many of its sites are on heathland where it is threatened by destruction of habitat or changes in management, particularly the loss of grazing, when it succumbs easily to the invasion of grass and scrub. The Forest Row site is currently the most easterly known site in Britain (by about 100 km), although it was once known from two areas of Norfolk which are slightly further east. The nearest extant sites are now in the New Forest. It is presumed extinct in West Sussex where the last known localities were Turner's Hill, 1953, FR and St. Leonard's Forest, 1980s, M. Briggs.

It also occurs in western and southern Europe, Asia Minor, North Africa and the Azores.

***Centaurium erythraea*. Common centaury, Gentian.**

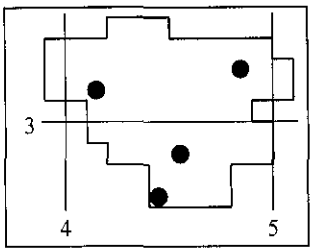


Near Forest Row, C. H. Waddell (Wolley-Dod 1937). Common on the Forest (Hall 1980).

Widespread on rides, paths, car parks, verges and in grassland around the Forest. Plants with white flowers occur occasionally (e.g. noted in 41.30, 43.20, and rides in Five Hundred Acre Wood 48.32).

Widespread in Sussex, common in the Weald, and widespread in lowland Britain, Europe and south-west Asia.

Centaurium pulchellum. **Lesser centaury.**



Broadstone Warren (42.32), 1954 and Fairwarp area 1956, P. A. Barker (BRC). Tetrads 43G and 43R (Hall 1980).

A few plants on west side of Wych Cross Reservoir embankment (419.315), 1995, TR & E. Goddard; abundant on ride in Funnell's Wood (442.262), 1995, TR & PA; verge by Box car park (459.287), 1993, DS *et al.*; Five Hundred Acre Wood (48.32), 1993, ER & RN.

Scattered in the Weald and adjacent chalk, one of its strongholds in Britain. It is locally distributed in the New Forest and the Bedfordshire area, and very rare and scattered around the coast of England and Wales. Widespread in Europe, especially near the sea, and west and central Asia.

****Blackstonia perfoliata.*** **Yellow-wort.**

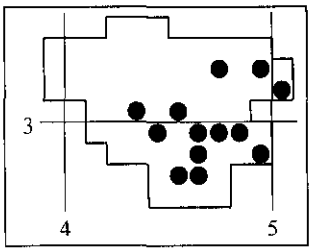
Meadow near Wych Cross, J. Weaver (Wolley-Dod 1937). Tetrad 42U (Hall 1980). Presumably introduced in both cases and not refound.

Common on the chalk in Sussex, and occasional in the Weald sometimes introduced. Locally abundant on chalk soils in southern Britain. West central and southern Europe, south-west Asia and Morocco.

Gentianella. **Gentians.**

There are records for *G. campestris,* field gentian "On Ashdown Forest" and for *G. amarella,* autumn gentian "On Ashdown Forest, near Wood's Nursery" in Deakin (1871), which possibly refer to the same plant, and also the same as the *G. amarella* record 'near Wood's Nursery, Maresfield, F. A. Malleson' in Wolley-Dod (1937). Of the two species *G. campestris* is more likely to have been present as it is not a strict calcicole, but neither are currently known and we have been unable to trace any specimens.

Gentiana pneumonanthe. **Marsh gentian, Calathian violet.**



On the Forest, about a mile north-east of Wood's Nursery, on a bank facing south-east, plentifully (Cooper 1835) [Wood's Nursery was between Fairwarp and Maresfield on Nursery Lane]. Ashdown Forest (Deakin 1871). In the Forest near Wood's Nursery, Maresfield, plentifully, W. C. Unwin; Ashdown Forest, Miss A. Wallis (Arnold 1887). Nutley Downs, 1889, T. Hilton (**BM**). Found on the Forest (Firmin 1890). Rest near Chelwood Gate, 1898, D'Alquin & C. E. Salmon (**BM; BTN**). Ashdown Forest (Done 1914). Heathy ground east of Chelwood Gate, 1919, F. J. Hanbury (**BM**). Near Chuck Hatch, 1933, W. C. Barton (**BM**). Between Nutley and Horney Common, A. G. Gregor; between Nutley and Fairwarp, Miss Gatty; bog near Chelwood Gate, abundant, C. C. Plowden; Wych Cross; damp heath near Pippingford Park, 1930, A. E. Ellis (**BTN**); valley between Pippingford and Nutley, E. C. Wallace; near Chuck Hatch, E. C. Wallace (Wolley-Dod 1937). Many references to plants at Pippingford Park, on a slope near Five Hundred Acre Wood, Duddleswell, two sites probably near Chelwood, and one site at Twyford, G. Dent (Dent 1928-1953). Masses in valley bog east of New Lodge Farm below Gills Lap, late 1940s, C. D. Pigott. Near Nutley, 1957, R. A. Boniface (BRC). Tetrads 42N, 42P, 42Z and 43F in Hall (1980), with nine extra tetrad records in Briggs (1990).

We have found Gentians in 13 squares on the Forest, with the main populations in the Misbourne valley and the Millbrook grazing enclosure. The populations vary in size from single flowering spikes to over 100 plants, but some populations in the 1950s had thousands of plants, FR. From casual observation they seem to be in decline as there is no room for new seedlings amongst the dense *Molinia* that surrounds them. Studies in the Netherlands have shown two types of population: on wet, inundated heaths populations have high recruitment of seedlings resulting in a dynamic population with plants of different ages; whilst in unfertilised grasslands dominated by *Molinia* there is very little recruitment and the static, even-aged populations slowly decline. Our populations on Ashdown Forest seem to be of the latter type. In the past grazing and trampling by the commoners' cattle and horses would have provided appropriate conditions for recruitment of new plants, and it may be significant that the largest remaining populations on the Forest are in the areas in which grazing continued the longest.

Gentians apparently regenerate well after mowing or grazing early in the year, but they are adversely affected by grazing at the wrong time, or lack of grazing. When grazing was re-introduced on 100 acres near Millbrook in 1989, the cattle grazed them unselectively so an exclosure was erected to protect them. Where grazing has been totally excluded the plants are surrounded by dense *Molinia* as elsewhere on the Forest, but they do flower and survive the grazing, albeit in lower numbers.

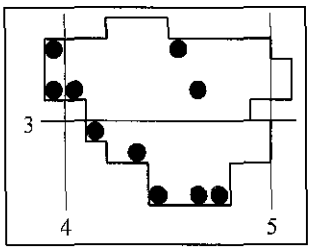
Marsh gentian is rare but locally frequent where conditions are right in Britain, but it is decreasing in many localities. It is a long-lived perennial with a mean life expectancy of about twenty years. The seed-bank is short-lived (no more than five years) so if seed production is wiped out one year by picking, mowing or grazing at the crucial time recruitment suffers (Chapman 1994).

A lowland species in the British Isles, confined to damp, acidic heathland in two main parts in England and Wales. In the south it extends from Dorset to Kent and Surrey, but is now probably extinct in West Sussex. In the north it occurs in North Wales, northern England and East Anglia. It has been recorded in 50 10-km squares in

Britain since 1970, and in another 76 10-km squares before 1970. Found throughout much of Europe from southern Scandinavia to the mountains of Spain, Italy and the Balkans, eastwards to central Asia.

APOCYNACEAE

***Vinca minor.* Lesser periwinkle.**

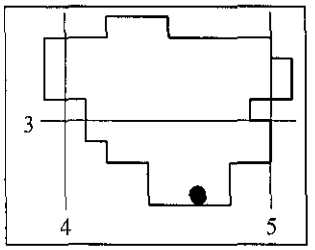


Four tetrads around the Forest (Hall 1980).

Recorded mainly around the edge of the Forest on banks and woodland edges and usually near houses, a result of dumping garden rubbish over a long period. Large patches 20 metres across were established on wood edge east of Fairwarp Village Hall (467.263), 1995, TR & G. M. Kay.

Locally established in Britain and more frequent than the following species. Native in southern, western and central Europe and western Asia, but widely introduced and its native range is difficult to establish. Some regard it as a possible native in south-east England as it is common in woods in north-west France.

***Vinca major.* Greater periwinkle, Pinpatch.**



A mile north of Maresfield, J. Edwards (Wolley-Dod 1937). Tetrad 42J (Hall 1980).

Fairwarp, small patch under oak where presumably dumped from gardens and rooting at the tips (465.265), 1995, TR.

Locally established in Britain. Native in the west and central Mediterranean region, introduced elsewhere.

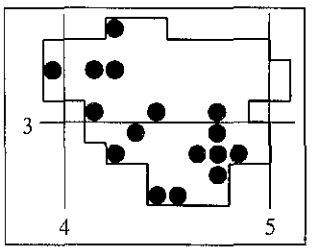
SOLANACEAE

***Hyoscyamus niger.* Henbane.**

On rubbish tip at Crow and Gate, Ashdown Forest, TWNH (Wolley-Dod 1937).

Henbane is normally found in disturbed areas on chalk or on sand near the sea (Johnstone 1994) so the absence of any records during this survey is not surprising. Decreasing in England (Rich & Woodruff 1996). Widespread in Europe, western Asia and North Africa.

***Solanum nigrum* subsp. *nigrum*. Black nightshade.**

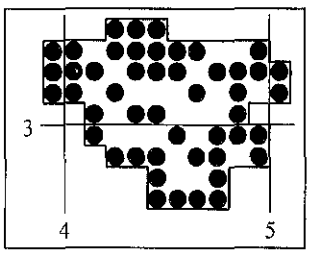


Six scattered tetrads (Hall 1980).

Recorded on waste ground, in the gutters along the roads, gardens and in the villages, and more rarely as an arable weed.

Common and widespread in Sussex and south-east England, scattered elsewhere in Britain. Widespread in Europe.

***Solanum dulcamara*. Bittersweet, Woody nightshade.**



Quite frequent in damp woods, ditches, and even in hedges with some climbing to over 2 metres tall. It is particularly characteristic of pond margins and marshy areas and the alluvial borders of ghylls. It occurs in a range of shaded and unshaded habitats, but usually on the more fertile soils.

Recorded in 98% of the tetrads in Sussex (Hall 1980). Common and widespread in lowland Britain, Europe, Asia and North Africa.

This species is sometimes erroneously called 'deadly nightshade'. It is poisonous but not as toxic as true deadly nightshade (*Atropa belladonna*) which does not occur on the Forest.

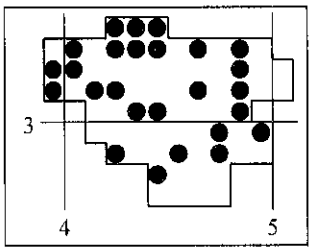
***Datura stramonium.* Thorn-apple.**

Tetrad 42N (Hall 1980). Not refound. This species is a scarce casual in Sussex which is rarely persistent - above ground at least, the seeds may be long-dormant. It is very poisonous.

It is widespread as a casual in Britain, and widespread in temperate and subtropical areas of the northern hemisphere.

CONVOLVULACEAE

Convolvulus arvensis. **Field bindweed, Lily.**

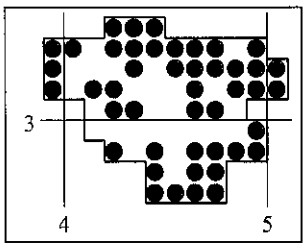


Common on the Forest (Hall 1980).

Frequent on waste ground, in gardens and lawns, occasional on mown and slightly disturbed road verges. The flowers last only one day each, opening in the morning and closing by the afternoon. Grime *et al.* (1988) note that its distribution and seed-set in Britain appear to be limited by climate. It is drought-tolerant and more common on south-facing slopes, and the roots may be damaged by freezing.

A pernicious weed in Sussex except on the Ashdown Sands. Widespread in Britain and temperate regions of the world.

Calystegia sepium. **Hedge bindweed, Grandmother's or Grandfather's Night-cap, Woodbine.**



Common on the Forest (Hall 1980).

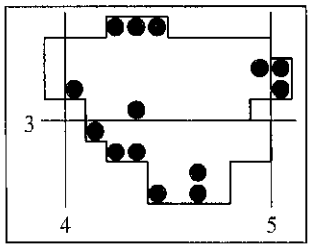
Widespread around the Forest though avoiding the acidic areas, and especially frequent along hedges off the Forest. Not all records may be *C. sepium sensu stricto* as vegetative plants cannot be determined with certainty, but it does seem to be more common than *C. silvatica*.

This species and *C. silvatica* are markedly self-incompatible, and as small populations are usually single clones, little or no seed is set (Walters & Martin 1958). Seed is however set in larger or obviously heterogeneous populations, and sometimes they hybridise with *C. silvatica* (we have not looked for hybrids).

Very common in Sussex and widespread in lowland Britain and temperate regions.

[***Calystegia pulchra.*** **Hairy bindweed.**
Tetrad 33V (Hall 1980); not refound and probably not in our Flora area.]

****Calystegia silvatica.*** **Large bindweed.**

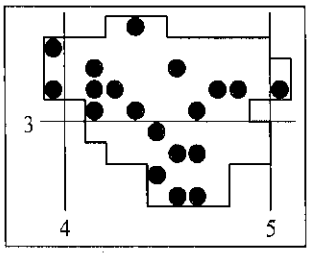


Frequent on the Forest (Hall 1980).

Occasional around the edges of the Forest, usually in the villages and near houses. It often forms large patches scrambling over hedges and verges. It is certainly less frequent than *C. sepium,* as it is elsewhere in Sussex. Widespread in lowland Britain. Native in southern Europe, the Caucasus and North Africa.

CUSCUTACEAE

Cuscuta epithymum. **Dodder, Devil's guts, Hell weed.** (Account by SR).



On Ashdown Forest (Coleman 1836). Webb (1885) found it in great quantities parasitic on fifteen different species "among others oak, hawthorn, agrimony, gorse, needlewhin, heath, ling, wax-heath, *Blechnum* fern, both on barren and fertile fronds, and bracken. It was very plentiful on gorse, heath and ling, but not so much on the others. In general the flowers were pinkish, hanging in little round bunches on deep purple stems, but I also observed some with pure white flowers attached to pale green stems, they did not grow in such full clusters as the purple ones did. The green plant was not in a more sheltered situation than the purple". On the Forest (Firmin 1890). Specimens collected by Miss P. Stockdale in 1911 were parasitic on *Calluna, Erica tetralix, Ulex minor* and *Origanum* (**BEX**). On furze near Crowborough (Done 1914). Ashdown Forest, 1934, D. P. Young (BRC). Frequent south of Forest Row, 1948, R. A. Boniface. Ashdown Forest, abundant after fire (Ross 1955). Near Nutley, 1957, R. A. Boniface (BRC). Frequent on the Forest (Hall 1980).

We have also recorded it scattered throughout the Forest, usually on rides and never abundant though probably most noticeable in 1995. It can sometimes be abundant after fires (Ross 1957) but the few fires seen on Ashdown Forest 1992-1995 have not resulted in any plants, and indeed one site was lost on Old Lodge Reserve following the fire in 1994. Quite why it is characteristic of rides is not certain, but it is definitely more frequent on them than in the surrounding heaths.

Dodder is a parasite of plants, mostly on heathland, chalk grassland and coastal habitats. It is totally parasitic, and is dependent on its hosts for all its nutrients and water, and its "leaves" which lack chlorophyll are reduced to small scales. Seeds germinate in spring after the other vegetation has started to grow, and produce fine yellowish threads which circumnutate around until they find a host plant. The thread then spirals around the host stems producing small papillae which develop into haustoria (the dodder:host interface). The haustoria

penetrate the host tissues, releasing enzymes allowing it to obtain water and nutrients, which also causes a proliferation of new growth in the host to which the parasite can spread. Once established the dodder roots die. The threads branching from any one point are different lengths which is believed to maximise its chances of striking another host. The effects upon host growth vary from necrosis of shoots and impaired flowering in *Ulex minor,* to discoloration of the growing shoots in *Calluna.* The reddish colour of heather attacked by dodder is quite noticeable late in the season on some rides on the Forest.

C. epithymum has been recorded parasitising numerous plants; van Ooststroom (1951) noted 91 hosts in Gotland, Sweden. The hosts on Ashdown Forest have been recorded for populations in seven sites:

Host species	Sites	Host species	Sites
Calluna vulgaris	7/7	*Potentilla erecta*	2/7
Deschampsia flexuosa	3/7	*Danthonia decumbens*	1/7
Erica cinerea	3/7	*Galium saxatile*	1/7
Molinia caerulea	3/7	*Pedicularis sylvatica*	1/7
Ulex minor	3/7	*Pteridium aquilinum*	1/7
Festuca filiformis	2/7	*Rubus fruticosus* agg.	1/7

These compare well with hosts previously recorded on the Forest (cf. above), but it almost always occurs on *Calluna* and spreads onto other plants from there, and is sometimes only weakly attached to grasses. The interesting one is *Pedicularis sylvatica* which is itself a semi-parasite on the roots of other plants, so it isn't only fleas which have smaller fleas!

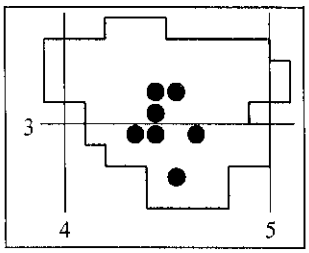
On chalk grassland dodder is predominantly found on legumes such as *Trifolium, Lotus* and *Medicago.* The dodders on chalk grassland are generally bigger and more branched with paler, larger flowers with shorter styles, and have been described as var. *trifolii* Bab. Seedlings taken from plants parasitising *Ulex minor* failed to grow on clovers suggesting that these races are physiologically different too and this may explain why *Trifolium, Lotus* and *Medicago* on the Forest are not parasitised (host specificity is known in other parasites such as mistletoe). Some of the morphological variation between the two races may be related to the differing nutrition available from the hosts; the luxuriant growth of var. *trifolii* could reflect the increased nitrogen levels in the hosts which have nitrogen-fixing bacteria in their roots, although this would be expected in *Ulex* on heathland too, or perhaps an adaptation to parasitising clonal patches of clover rather than isolated heathland shrubs.

Although commonly thought of as an annual regenerating each year from seed, Shillito (1952) demonstrated that *C. epithymum* can over-winter on woody hosts by means of tubercles. These organs appear as tiny scales on the host above the haustoria and develop after the stems die back in late autumn. The following spring they develop new stems which grow and infect more plants, giving an instant early start to the dodder. This is almost certainly the main form of perennation on Ashdown Forest since patches can be found in exactly the same location from year to year, usually on *Calluna,* provided the rides have not been mown too short. The role of tubercles in var. *trifolii* would be interesting to investigate on chalk grasslands since the availability of over-wintering perennial hosts is less than on heathlands, and also in the related *C. europaea* which typically parasitises *Urtica* and *Humulus* on riverbanks.

Locally common in southern Britain and most of Europe, and in temperate Asia and North Africa.

MENYANTHACEAE

Menyanthes trifoliata. **Bogbean.**



Near Coleman's Hatch, B. B. Gough; near Crow's Nest, Camp Hill, E. M. Day; Poundgate, A. G. Gregor (Wolley-Dod 1937). Ashdown Forest, 1942, L. M. Child (**TLS**). A number of references to Chelwood and Duddleswell, with a note to go looking for it before the end of May (Dent 1928-1953). Chelwood Gate (42.30), 1955, and near Nutley, 1957, R. A. Boniface (BRC). West of Fairwarp, in the Coleman's Hatch area, at Upper Chuck Hatch and at Newbridge Bog, 1950s, FR. Tetrads 42N, 42P, 42T and 43F (Hall 1980).

Large patches in pond at Chelwood Vachery (430.295), 1994, TR, MR & PR; small patch in wet boggy flush near Londonderry Farm (445.292), 1992+, NM *et al.*, and another at 444.292, 1992, NM which appeared following re-introduction of the grazing in 1989, possibly from buried seed or perhaps just more visible when the grass was eaten; lakes in Pippingford Park (44.30 and 44.31), 1993+, Flora meetings but gone from pond in 44.31 where it was last recorded in 1987, R. Fitzgerald *et al.*; bog west of Airman's grave (458.297), 1991, CM; small pond east of Old Lodge (467.297), 1992, NM & CM.

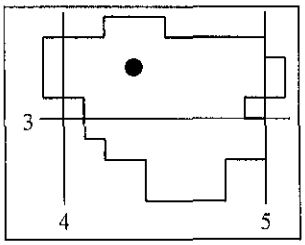
Scattered in Sussex and south-east England and decreasing (Rich & Woodruff 1996), though still widespread and common in the north and west. Widespread in Europe except near the Mediterranean, Asia, Morocco, Greenland and North America.

Nymphoides peltata. **Fringed water-lily.**
Cackle Street, 1933, G. Dent (Dent 1928-1953).

Not refound. Although probably native in parts of eastern and south-eastern England it is likely to have been planted at Cackle Street, as it is widely elsewhere. Widespread in Europe and Asia.

POLEMONIACEAE

Polemonium caeruleum. **Jacob's-ladder.**



Appropriately enough, an escape at Friar's Hill (Wolley-Dod 1937).

Under bracken on bank between car park and heath, Ashdown Forest Centre (433.323), 1988, Sue Buckingham, but gone by 1994 and probably before. It appears to have been introduced with soil brought in when the cess pit for the centre was enlarged, and persisted for a few years.

A rare escape in Sussex and increasing as a garden escape in England (Rich & Woodruff 1996), but native in northern England. The native form has leaflets mostly three times as long as wide, whilst cultivated and garden plants have leaflets mostly less than about 2.7 times as long as wide, and are of European origin (Pigott 1958).

Widespread in north and central Europe, Caucasus, Siberia and North America.

BORAGINACEAE

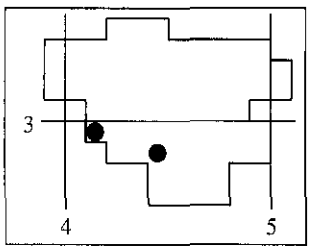
Echium vulgare. **Viper's-bugloss.**
Tetrad 42P (Hall 1980). Not refound.

Locally frequent on the chalk and coast in Sussex, especially around rabbit burrows. Still widespread in eastern England but decreasing (Rich & Woodruff 1996). Widespread in Europe and temperate Asia.

Pulmonaria officinalis. **Lungwort.**
Tetrad 43A, 1987, MM; not refound.

Widely established as a garden escape in Britain. Native in Europe.

Symphytum officinale. **Common comfrey, Knitbone, Bruisewort.**



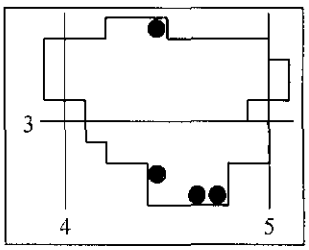
Tetrad 43P (Hall 1980).

Chelwood area (41.29), 1994, Flora meeting; Nutley area (44.28), 1995, MM.

Frequent in Sussex, often on river banks and other damp places, but easily confused with *S.* × *uplandicum*; *S. officinale* in Sussex usually has cream or white flowers and strongly winged stems.

Planted and grown by local herbalists in the early 20th century for use on sprains and fractures. Widespread in lowland Britain and in Europe except the extreme south and often introduced in the north; temperate Asia.

Symphytum × ***uplandicum.*** **Russian comfrey.**

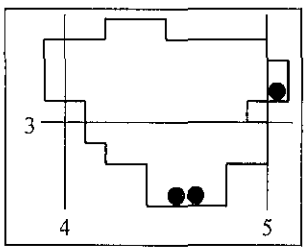


Frequent on the Forest (Hall 1980).

Established outside garden amongst bracken (446.275), 1995, TR; Lines Farm stream (444.347), 1993, TR & EL; Toll Lane, patch on verge (46.26), 1995, PD & RN; A26 verge near Claygate Farm (478.262), 1995, TR.

It was once grown for fodder, and may not be well-established in the Forest as it is rapidly devoured by deer, and the soils may also be too acidic. Widely established in Sussex, lowland Britain and Europe.

Symphytum tuberosum. **Tuberous comfrey.**

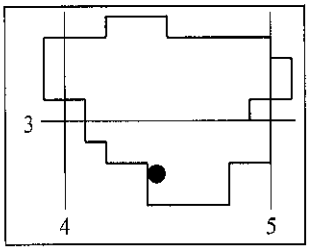


Near Fairwarp, E. D. Morgan; roadside north of Maresfield, Wolley-Dod (Wolley-Dod 1937).

Boringwheel Mill area (45.26), 1994, Flora meeting; Fairwarp, by the bus shelter (465.264) and by the village hall (467.263), 1992+, B. Hoath where it apparently arrived in soil at the former and also nearby on Nursery Lane when some minor road improvements were carried out; St John's car park (504.316), 1991+, PW.

A rare plant in Sussex and presumably introduced. Native in west, central and southern Europe northwards to England, and possibly in Scotland.

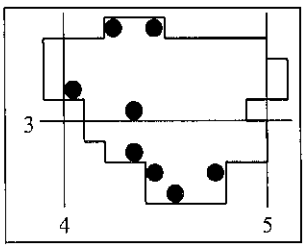
***Symphytum orientale.* White comfrey.**



Lane side from nearby garden, Nutley (446.276), 1995, TR.

A rare garden escape in Sussex, and scattered in south-east England. Native in Anatolia.

***Pentaglottis sempervirens.* Green alkanet.**

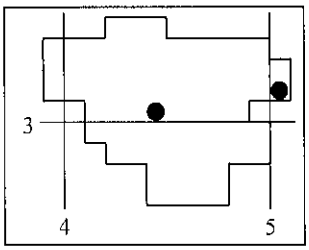


Tetrad 42T (Hall 1980).

Scattered on waste ground and in hedges usually near habitation, and especially in the villages.

A frequent garden escape in Sussex. Widely established and increasing in England (Rich & Woodruff 1996). Native in south-west Europe, and widely naturalized in north-west Europe.

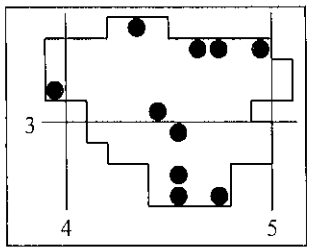
***Borago officinalis.* Borage.**



Waste ground near Home Farm (444.303), 1993, SBRS; St Johns (50.31), 1991+, PW.

A garden escape occasionally established in Sussex and Britain. Native in southern Europe.

***Myosotis scorpioides.* Water forget-me-not.**



Frequent on the Forest (Hall 1980).

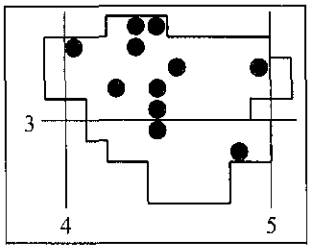
We have found this large-flowered water forget-me-not on the edges of ponds and streams, usually in open situations scattered around the Forest with a few records from Pippingford Park.

Grime *et al.* (1988) note it occurs on a wide range of soils from calcareous to mild acidic (pH > 5), and is tolerant of fluctuating water tables. It often forms clonal patches and may spread vegetatively along water courses. The seeds do not float. It is common along riverbanks, lakes and ponds in Sussex and Britain, and mainly occurs in central and northern Europe. It also occurs in Asia and North America.

As the water forget-me-nots are often confused, the following Table should help with their identification on Ashdown Forest:

	M. scorpioides	*M. secunda*	*M. laxa*
Corolla	To 8 mm across.	To 6 mm across.	To 5 mm across.
Calyx lobes at flowering	Lobed less than half way, equilateral triangular in shape.	Lobed half way or more, isosceles triangular in shape.	Lobed half way or more, isosceles triangular in shape.
Stem hairs	Appressed or sometimes patent.	Lower part with spreading hairs, upper appressed.	All hairs appressed.
Stolons	Usually present.	Present.	Absent.

Myosotis secunda (M. repens). **Creeping forget-me-not.**

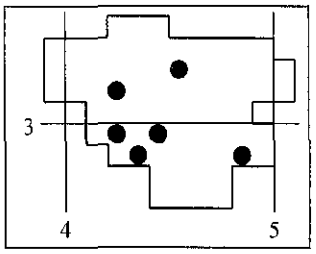


Ashdown Forest, between Forest Row and Crowborough, W. W. Reeves (Arnold 1887). In a bog south of Coleman's Hatch (Done 1914). Quabrook Common, E. Forster; Ashdown Forest between Forest Row and Crowborough, abundant, W. W. Reeves (Wolley-Dod 1937). Tetrads 42T, 43K and 43L (Hall 1980).

A distinctive plant, quite characteristic of acidic pond margins and iron flushes, which is tolerant of iron compounds produced under anaerobic conditions which are normally toxic to plants. It is typical of quaking areas between the alder stumps as at Newbridge (455.324), and also abundant round some shaded ponds, as at Pippingford Park (446.312). Grime *et al.* (1988) note that it often replaces *M. scorpioides* by acidic and nutrient-poor water.

A very uncommon plant of the Weald in Sussex (Hall 1980) and Kent, but perhaps overlooked? More frequent in North and west Britain, and in western Europe, Azores and Madeira.

Myosotis laxa (M. caespitosa). **Tufted forget-me-not.**

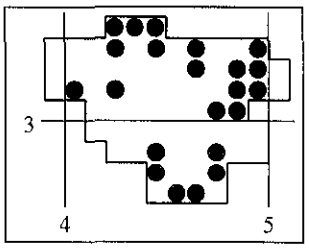


Occasional on the Forest (Hall 1980).

This small-flowered water forget-me-not is recorded occasionally in open flushes and ditches around the Forest. It is an annual or biennial and tends to occur on nutrient-rich mud in disturbed places.

Frequent in marshes and wet places in Sussex, especially on the Tunbridge Wells Sands, and widespread in Britain. Widespread in Europe, but rare in the south, Asia and North Africa.

Myosotis sylvatica.* **Wood forget-me-not.

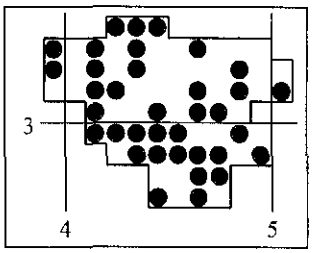


Tetrads 43A, 43R and 43V (Hall 1980). Tetrads 43M and 43W (Briggs 1990).

Widely grown in gardens, and most of our records are associated with the villages and obvious garden escapes. It is possibly native in some woodland sites, and can be found in the alluvial woodlands on damp but not wet soils.

Occasional in Sussex and accepted as native by Hall (1980) where it may be native in alluvial woodlands along the Rother, on Weald Clay and in old woodlands near Horsham (FR, pers. comm. 1996) but also an escape from cultivation. It is certainly native in woodlands in mid and northern England, but is widespread as an introduction and is increasing elsewhere (Rich & Woodruff 1996). Widespread in Europe except the south-west and the north.

Myosotis arvensis. **Field forget-me-not.**

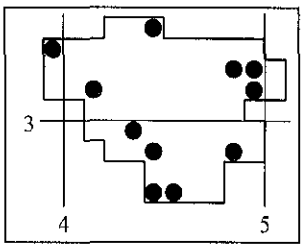


Common on the Forest (Hall 1980).

Scattered on shaded woodland rides, in gardens and in the villages, in a few arable fields, and on roadsides around the Forest. It is an annual and occurs in open habitats on mildly acidic to calcareous soils (pH >5). It varies in size depending on the environment and time of germination.

Very common in Sussex and lowland Britain. Throughout Europe, and in temperate Asia and North Africa.

Myosotis discolor. **Changing forget-me-not.**



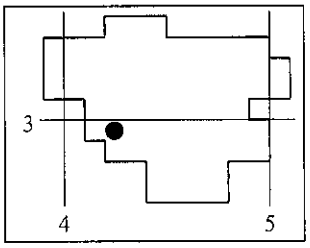
Tetrads 43K and 43M (Hall 1980).

Scattered around the Forest on the sandier tracks, bare open areas and sometimes on waste ground. It is often found in surprisingly damp places.

Scattered in Sussex mostly on coastal beaches as it is in Hampshire, in dry open places and on walls. Widespread in Britain, and mainly western in Europe.

VERBENACEAE

***Verbena officinalis*. Vervain.**



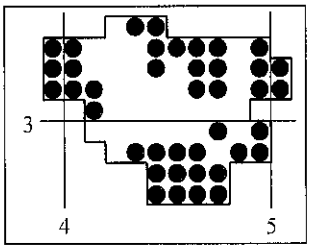
Tetrad 53A (Hall 1980), possibly outside our area.

Streeter's Rough area (42.29), 1993, TR.

Common on the chalk in Sussex and occasional elsewhere, and sometimes on dry roadsides in the Weald. Mainly in southern Britain, and widespread in Europe and western Asia; also found in North Africa.

LAMIACEAE (LABIATAE)

***Stachys officinalis*. Betony.**

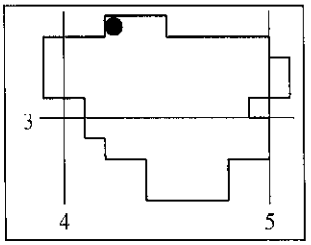


Common on the Forest (Hall 1980).

One of our most attractive plants, especially when present in large numbers. Our survey shows it to be widespread in the south, west and north-east of the Forest but strangely absent from a band running diagonally in from the north-west corner. As *Stachys officinalis* is such a well-known and relatively conspicuous plant the map almost certainly reflects its true distribution. The reason for its absence from these areas is unclear as it is found mainly in open woodland, grassland and road verges (Plate 3), habitats which are present in many of the squares where we have no records.

Common in most of England and Wales except East Anglia and widespread in Europe outside Scandinavia, also in Caucasus and Algeria. Decreasing in England (Rich & Woodruff 1996).

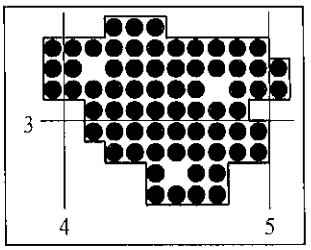
***Stachys byzantina*. Lamb's-ear.**



Seedlings on tipped soil, Kidbrooke (420.346), 1995, TR, but not established.

It is widely grown in gardens and occasionally established in Britain. It is native in south-east Europe and south-west Asia.

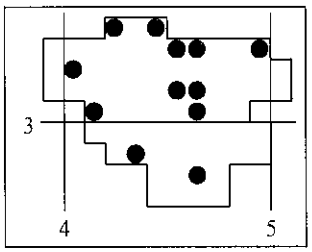
***Stachys sylvatica*. Hedge woundwort.**



Described as ubiquitous in Hall (1980) and found to be similarly widespread on shady road banks, and in hedges and woods during our survey. It occurs on moist, fertile soils usually of pH 6-8 but not below pH 4 (Grime *et al.* 1988), and is tolerant of light shade, forming clonal patches by the spreading underground rhizomes.

Common throughout the whole of Britain and much of Europe except the Mediterranean where it becomes scarce. Also found in the Caucasus and Kashmir.

***Stachys palustris*. Marsh woundwort.**

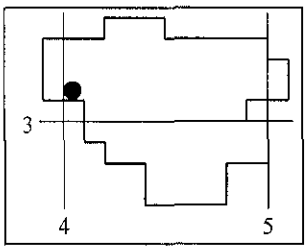


Occasional on the Forest (Hall 1980).

We have twelve scattered records, mainly from wet places such as along the Medway, although the record from Gills Lap is for a plant growing in the road gutter by the entrance to North Park car park (467.315), PW, where it has persisted for some years. It also grows on wet verges with *Silaum* near Chelwood Gate (415.304), 1993, TR. It mainly occurs in damp, relatively undisturbed sites in eastern England presumably due to sensitivity to drought, but in the damp, humid climate of western Ireland occurs very frequently as a weed of disturbed ground.

Present throughout much of Britain, and in Europe, but becoming scarce around the Mediterranean and in the north of Scandinavia. Also found in temperate Asia and North America.

***Stachys arvensis*. Field woundwort.**

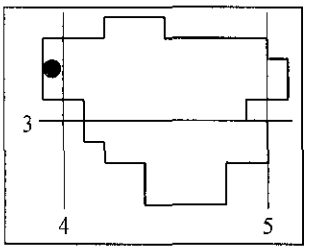


Chelwood Common, Miss M. Cobbe; near Fisher's Gate, rare, E. D. Morgan (Wolley-Dod 1937). Tetrads 42N and 42T (Hall 1980).

One plant seen on a roadside near Suttons Farm (401.312), 1990, DB. An inconspicuous but attractive annual normally found as a weed in arable fields on sandy, non-calcareous soils. Its rarity is to be expected given that, even in the past, arable land was never widespread in the Forest.

Decreasing in England (Rich & Woodruff 1996). Scattered over Britain and much of Europe as far north as southern Sweden, Asia Minor and North Africa.

****Ballota nigra*. Black horehound.**

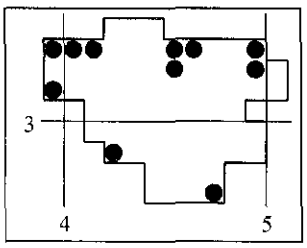


Surprisingly scarce, with only a single record from Horncastle (39.32), 1995, DB but this is consistent with the distribution given in other sources. Hall (1980) shows it as common in the southern half of both East and West Sussex but very scarce in the north-east and north-west of the counties, and the distribution in Kent shows a similar absence from the High Weald (Philp 1982). The same "hole" in its otherwise almost ubiquitous distribution in south-east England can be seen clearly in the map in Perring & Walters (1990). Hall suggests a climatic factor may be involved in the distribution but, if this really is the case, it is not clear what it might be. More work is needed before the virtual absence of *Ballota* in this area can be explained.

It occurs most frequently in dry, dirty, dusty places near habitation, and on waste ground, and maybe Ashdown Forest is too up-market for it.

Common in much of England, south and west Wales but rare in Scotland and only present in Ireland as an introduction.

***Lamiastrum galeobdolon* ssp. *montanum (Galeobdolon luteum)*. Yellow archangel.**

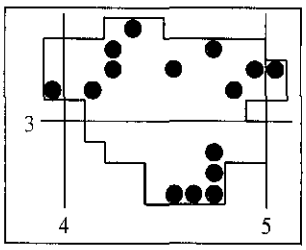


Inadvertently omitted by Hall (1980) but shown as common in the map supplied as corrigenda and published in Briggs (1990).

We have records from eleven squares around the edges of the Forest. Yellow archangel is distributed throughout the southern half of Britain and is generally thought to be an indicator of ancient woodland. Our records are for woods and, occasionally, old hedgebanks. Its distribution around the edge of the Flora area reflects the fact that it is found only on the heavier base-rich clay soils, avoiding the more acidic sandy areas completely. Packham (1983) notes it grows poorly on soils below pH 4.3.

Widespread in Europe except Scandinavia and the Mediterranean, and found in Iran. Its northern limit in Britain may be caused by inhibition of sexual reproduction in the cool, damp summers. In Europe its southern limit may be due to limited rainfall as it is not very tolerant of drought, and it is more restricted to woodland in the eastern part of its range (Packham 1983).

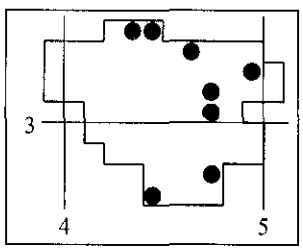
****Lamiastrum galeobdolon* ssp. *argentatum (Galeobdolon argentatum)*. Silver archangel.**



An increasingly common garden escape or, perhaps more accurately, garden throw-out. Scattered around the Flora area near houses, on roadsides or beside lay-bys, where those who have become tired of its rampant growth in their gardens have discarded it.

The origin of this subspecies is unclear but it is now scattered over much of Britain. It has large silver blotches on the leaves (see Rich & Rich 1988), but subsp. *montanum* plants may also have a few silver speckles.

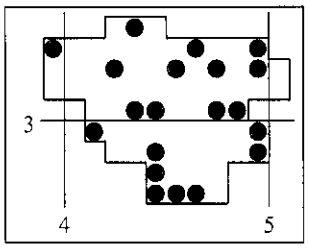
***Lamium album*. White deadnettle.**



Generally regarded as a common plant, the distribution in Hall (1980) shows that *Lamium album* is indeed frequent in many parts of Sussex but is absent from much of Ashdown Forest and much of the Kent Weald, as is *Ballota nigra* too. This has been confirmed in our survey where we have records from only seven 1-km squares in the north and east of the area. Although its absence from the more acid, sandy areas is unsurprising, it is not clear why it does not occur more widely around the edges of the Forest. It is a weedy perennial species of disturbed, nutrient-rich sites (often fouled by dogs) but does not even seem common in our villages.

Common throughout most of south-eastern Britain but becoming rarer in the west and restricted to nutrient-rich sites. Widespread over much of Europe except the far north and south. Also found in Himalaya and Japan.

Lamium purpureum. **Red deadnettle.**



This species was recorded in 90% of the tetrads in Sussex by Hall (1980) and is extremely common all over southern England. It is, however, present in only 30% of the 1-km squares in our area. Its sites on the Forest are strongly associated with human activity, occurring in gardens, disturbed areas on road verges and track sides or as a pavement weed in the villages. It is absent from large areas of woodland and heathland.

Very common throughout Britain and much of Europe.

Galeopsis tetrahit s.l. **Hemp-nettles.**

This aggregate is composed of *G. tetrahit sensu stricto* and *G. bifida*. They can only be distinguished in flower so our vegetative plants have been mapped as the aggregate. The aggregate is shown as common in Hall (1980) but there is little reliable indication of the relative frequencies of the two segregates.

Plants of the aggregate generally occur in disturbed habitats such as pathsides, the edges of arable fields and heaths, in light secondary woodland and by hedges. They are usually summer annuals and flower late in the season.

Galeopsis tetrahit s.s. **Common hemp-nettle.**

Confirmed in only three localities around the edge of the Forest during our survey.

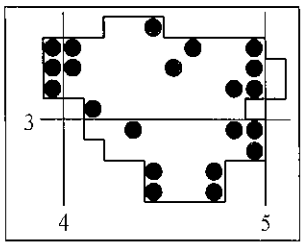
Common throughout Britain and Europe except the far south-east.

Galeopsis bifida. **Bifid hemp-nettle.**

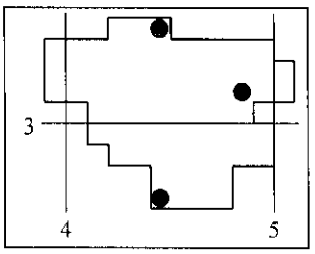
Found to be more common than *G. tetrahit* during our survey despite the fact that Hall (1980) has no records for the area. This is certainly due to under-recording of this species in the past. The national distribution is not clear but it is certainly present over much of the range of *G. tetrahit s.s.*

In Finland, studies have shown that 96-100% of the seeds are dormant for at least ten years (Hintikka 1987). Seeds are probably stimulated to germinate by clear-felling and burning, and plants can dominate areas after forestry work has been carried out. This strategy enables it to colonise disturbed competition-free habitats. It behaves similarly on Ashdown Forest, occurring on small disturbed areas and retreating into the seed bank as the vegetation closes over again.

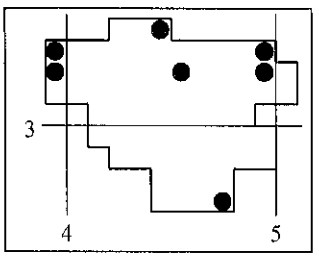
Galeopsis tetrahit s.l.



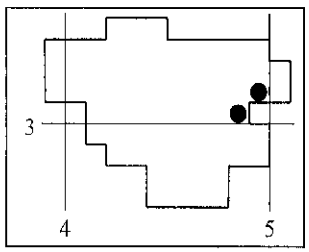
Galeopsis tetrahit s.s.



Galeopsis bifida



Scutellaria galericulata. **Skullcap.**

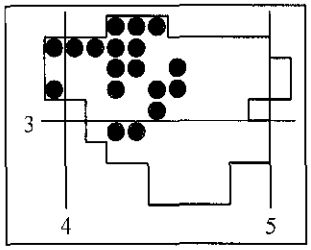


Bogs near Gills Lap, Ashdown Forest (Coleman 1836). Forest Row, 1910, Miss P. Stockdale (**BEX**). Occasional (Hall 1980).

We have only accepted two modern records, but there could be more: Old Mill (48.30), 1995, AK; stream woodland near Cowfield (49.31), 1995, TR & PA. In 1993 vegetative plants with toothed leaves were recorded widely in woodland, rides, ditches and streams and ponds, but were withdrawn in 1994 after we had discovered that *S.* × *hybrida* was much more common. It is quite possible that some of the records in Hall may be for the hybrid (see below).

S. galericulata is a plant of rather wet, swampy places, favouring the edges of streams and ponds or wet grassland. It is a lowland plant with a wide distribution, occurring throughout Europe, in Asia, Algeria and North America. In the UK it is widely distributed over most of the country except in north-east England and eastern Scotland. It is decreasing in England (Rich & Woodruff 1996).

***Scutellaria* × *hybrida* (*S. galericulata* × *minor*).** **Hybrid skullcap.**



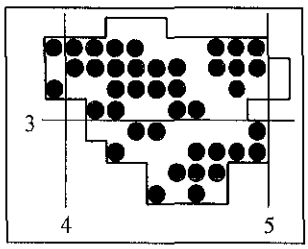
Hall (1980) has a single tetrad record, 43W, and there is a more recent record for the area from 33V, A. G. Hoare, confirmed by A. C. Leslie (Briggs 1990).

We have a total of 17 1-km square records, many more than the parent *S. galericulata*. The hybrids are especially locally abundant along the streams and rides of the woodlands in the north-west corner of the Forest. They occur in dense shade as well as in the open, and appear fairly uniform in cultivation but vary due to environmental conditions such as shade. The plants tend to form patches by the creeping rhizomes, and many of the patches have probably spread vegetatively (no seed has been found on any of the plants examined) and populations may be clones. They are rather shy-flowering and a good indicator of the hybrid is the presence of many non-flowering plants. For example, when AK first saw the colony in Plaw Wood in the late summer of 1993 hundreds of plants were present but none could be found in flower so confirmation had to wait until 1994 when a number of plants flowered. They can be distinguished as follows:

	S. galericulata	*S.* × *hybrida*	*S. minor*
Number of teeth on mid-stem leaves	8-23.	6-13.	1-4.
Flowers	Deep blue.	Pale purplish-blue.	Pink.
Flower size	10-20 mm.	7-12 mm.	6-10 mm.
Fertility	Fertile.	Sterile.	Fertile.

This plant is certainly more common in and around our area than has been previously supposed and it is quite likely that it may have been wrongly recorded as *S. galericulata*. Some examples of places to see it are as follows: abundant along public footpath, Plaw Wood (394.333), 1994, PW, AK (neither parent could be found); north edge of pond, Priory Road (413.339), 1995, TR; large patch beside path just west of the A22 with *S. minor* (419.336), 1995, AK; abundant in the alder clearance area at Newbridge (458.323), 1994, Flora meeting. The lack of recognition of this species means that its distribution is poorly known, and it could be much more widespread.

***Scutellaria minor*.** **Lesser skullcap.**

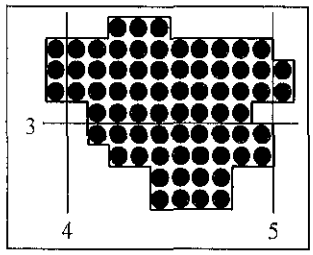


Bogs on Ashdown Forest (Coleman 1836). Ashdown Forest, M. R. Dixon, 1886 (Arnold 1887). Near Nutley, 1957, R. A. Boniface (BRC). Common on the Forest (Hall 1980).

Found over most of the Forest in our survey. This might be expected as the typical habitat for *S. minor* is damp heathland and woodland rides. It was abundant after scrub clearance on A275, plants being pollinated by both honey and bumble bees (the bumblebees caused the whole plants to bend over). It varies from 5-10 cm tall in dry, open areas to nearly 70 cm tall in *Molinia* tussocks on Old Lodge Reserve.

It is much less widely distributed than *S. galericulata,* being calcifuge and found in England almost exclusively south of a line through Bristol and scattered throughout Wales. It is a western European endemic.

***Teucrium scorodonia*.** **Wood sage.**

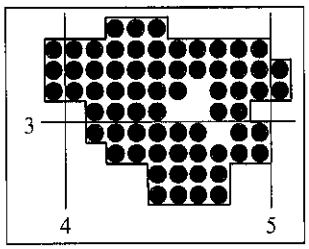


Ubiquitous, occurring in dry places in woodland, hedgebanks and road or track verges. Although very common in our area and most of Sussex, *T. scorodonia* is scarce in many areas in the south of West and East Sussex.

It is a slow-growing perennial herb which forms patches and can be locally abundant. It has physiologically distinct populations which differ in soil and shade requirements (Hutchinson 1968). It occurs mainly on either calcareous (pH>7) or acidic (pH 4-5) soil; clones from the two types grow best on their own soils. Plants from woodland tend to put their resources into developing more leaves to catch more light, whilst plants from the open sites develop extensive root systems to help maintain a water supply to survive drought. On the Forest it occurs mainly in the open and along woodland edges which may be clones preferring open conditions as most of the woodland is secondary.

Distributed over most of Britain, much of Ireland and an endemic of south, west and central Europe as far north as Germany, the Netherlands and southern-most Norway.

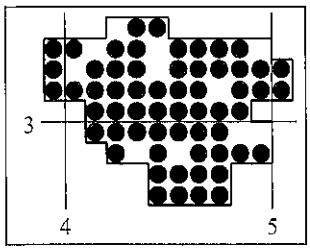
Ajuga reptans. **Bugle.**



Very common in our survey, in agreement with Hall (1980), generally found on the richer soils. A pink-flowered plant was recorded near Crow and Gate, Crowborough (Wolley-Dod 1937), and pink-flowered forms were noted in 39.32 and 42.29, 1994, TR.

Common over most of Britain and Europe as far north as the south of Sweden. Also found in western Asia and North Africa.

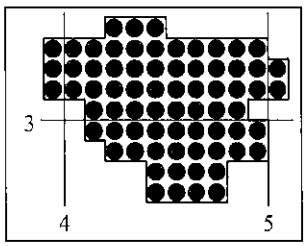
Glechoma hederacea. **Ground ivy, Alehoof, Lion's mouth, Robin-run-in-the-hedge.**



Ubiquitous (Hall 1980) and similarly very common in our survey. It is found in a variety of places including the verges of roads and tracks, under hedges and in some areas of woodland. It is not eaten by rabbits and often large patches occur in heavily grazed areas.

Common in Britain and Europe with the exception of the far north; west and central Asia to Japan.

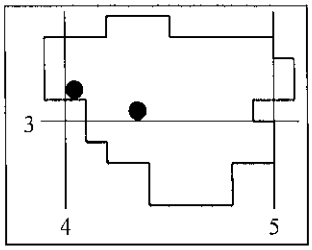
Prunella vulgaris. **Self-heal.**



One of our truly ubiquitous species, occurring on road verges, by tracks and in gardens, grassland and woods but absent from undisturbed heathland.

Common throughout Britain and most of Europe; temperate Asia, North Africa, North America and Australia.

****Melissa officinalis.*** **Lemon balm.**

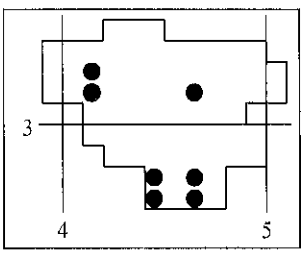


No records from our area in Hall (1980) but now with two occurrences on the Forest. A small clump in a large lay-by car park beside the A22 (436.303), 1985, CM and still present had clearly been dumped. Another patch near Smockfarthing (401.319), 1994, TR was probably planted.

A native of southern Europe, western Asia and North Africa, naturalized in many places in the south of Britain and widely cultivated for its lemony leaves.

[***Clinopodium ascendens (Calamintha ascendens).*** **Common calamint.**
Recorded in error for *C. vulgare* by Fincham (1995).]

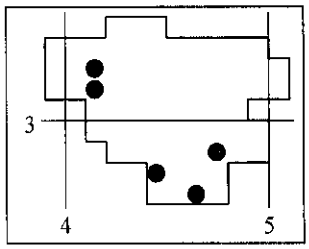
Clinopodium vulgare. **Wild basil.**



Occasional in Hall (1980), mainly at the southern edge of the Forest and with seven records in our survey of which only those from 46.26 and 46.27 correspond to the records in Hall. Mainly found on road verges (e.g. west of Wych Cross 413.320, pH 7.6, entrance to Old Lodge 469.305) probably where chalk has been used as a construction material, which explains why *Origanum vulgare* occurs with it in four of the areas. It was also found on a woodland ride at Toll Lane (463.263), 1995, PH & PD.

Common in the south but less so in the north, widespread in Europe except in the far north, central and western Asia, Siberia, North Africa and North America.

***Origanum vulgare*. Marjoram.**



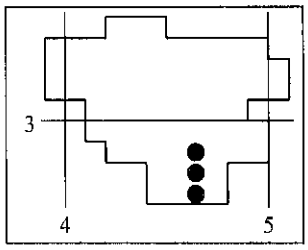
Near Fisher's Gate, one large plant, A. H. Wolley-Dod; Ashdown Forest, Miss A. B. Cobbe (Wolley-Dod 1937).

Hall (1980) has records from tetrad 43A only in the south-west of our area. Our survey shows a rather wider distribution with records from five squares. *Origanum vulgare* is even more closely associated with chalk than is *Clinopodium vulgare* so the presence of both plants in four of its five locations is strongly indicative of the presence of introduced chalk in these places.

The distribution in Britain and Europe is broadly similar to the preceding species. Common in the south but becoming less so in the north, widespread in Europe except in the far north, and in north and west Asia. Decreasing in England (Rich & Woodruff 1996).

[***Thymus praecox*. Wild thyme.** We have no records from our survey but it was recorded from tetrad 43P in Hall (1980). However, this is probably an error for *T. pulegioides* which is the commonest thyme of heathlands in the south-east.]

***Thymus pulegioides*. Greater thyme, Large thyme.**

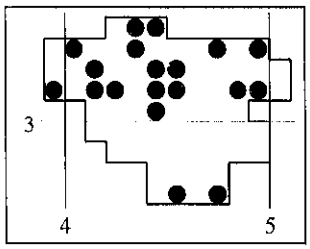


Thyme is mentioned in a poem about Broadstone by J. Hayward in 1865 (*AFN* 16: 9-11), but it was either poetic licence or has gone. Tetrad 42T (Hall 1980).

Recorded from the south of the Forest in three 1-km squares, two of which lie in 42T: wall of Fairwarp Church by gate (465.267), 1995, TR; bank at B2076 entrance to Spring Garden (465.270), pH 7.8, 1993, RN & ER; road bank opposite Duddleswell tea rooms (468.284), pH 6.7, 1995, RN & ER.

Although *T. pulegioides* is commonest on the chalk in Sussex there are a number of records from the heathlands on the Tunbridge Wells Sand to the south and south-east of the Forest (Philp 1982). Our pH measurements indicates that they may often still be on calcareous soils! It is found in southern and eastern England, and widely distributed in Europe with the exception of the far north-west.

***Lycopus europaeus*. Gypsywort.**

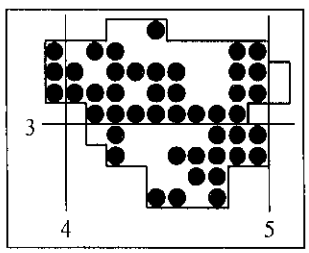


Common on the Forest (Hall 1980).

Widespread in the northern part of the Forest. Our records are from a variety of wet places, including marshes, stream banks and the edges of ponds but not the more acidic boggy areas or wet heath. The absence of gypsywort from the more acidic areas can be seen very clearly by comparing its distribution with that of *Narthecium ossifragum*, which is a characteristic plant of wet, acidic places. Despite the fact that *Lycopus* is recorded in eighteen 1-km squares and *Narthecium* in 28, there are only two 1-km squares on the Forest where both plants are present.

Common in the south of Britain but becoming scarce in the north, widespread in Europe, reaching as far north as southern Sweden, north and central Asia and North Africa.

***Mentha arvensis*. Corn mint.**

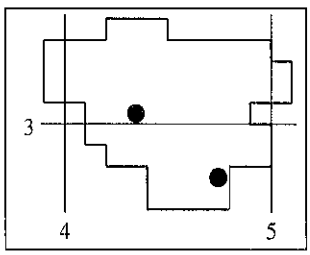


Pressridge Warren, Summerhayes & Redhead (Wolley-Dod 1937). Common (Hall 1980).

Only slightly less common than *M. aquatica* and generally found in damp rather than wet places, often along the edges of rides in woodland.

Widespread in Britain and Europe but absent from the north-western extremities; North Asia to the Himalaya.

***Mentha* × *verticillata* (*M. aquatica* × *arvensis*). Whorled mint.**

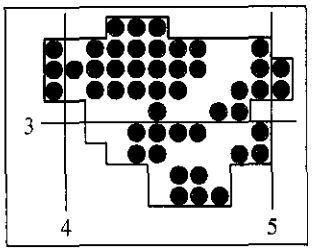


Tetrad 43R (Hall 1980).

We have two records, neither of which is for Hall's tetrad: lane to Chelwood Vachery (434.303), 1994, PD *et al.*, growing with fertile *M. arvensis*; ornamental pond by Oldlands Hall (476.275), 1995, TR *et al.*, possibly planted.

A sterile hybrid widespread in Britain where the parents meet.

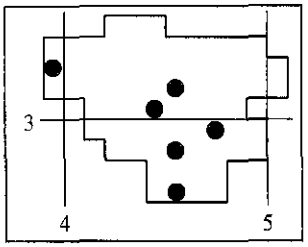
Mentha aquatica. **Water mint.**



Always common (Hall 1980) and still found in large quantities in wet places over much of the Forest with the exception of the most acidic areas. Quite often first detected by the strong minty smell arising from underfoot. It is quite shade-tolerant but may not flower in woods.

Present throughout Britain and much of Europe north to southern Sweden and Norway. Also found in south-west Asia, Africa and Madeira.

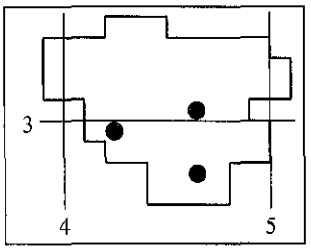
****Mentha spicata.*** **Spear mint.**



An introduction with no previous records but found in five squares during our survey: naturalized at Horncastle House (392.323), 1995, DB; near Home Farm (44.30), 1993, SBRS; Boringwheel Mill Farm (45.26), scarcely naturalized; Friends car park (45.28), 1993, PD; Pippingford Park (45.31), 1995, Flora meeting; Camp Hill (47.29), 1995, RN.

Of unknown origin, now widely naturalized in Britain and much of Europe.

Mentha x villosa. **Apple mint.**



A single record from 43V is given in Hall (1980) which was not refound in this survey.

Streeter's Rough (42.29), 1993, TR; ride, Duddleswell (46.27), 1995, TR; one patch on lane to Old Lodge (465.304), 1993+, DK. All are referable to var. *alopecuroides*.

Probably of garden origin and widely naturalized in Britain and western Europe, like most other mints.

Mentha pulegium. **Pennyroyal.**

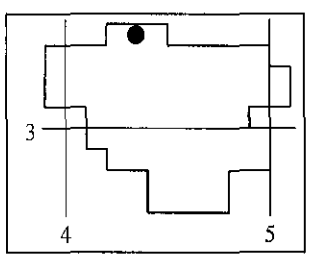
There are old records for this attractive plant from the Forest, Ashdown Forest, and near Forest Row, W. W. Reeves (Arnold 1887) but unfortunately it has now disappeared from the area and is only known in Sussex as an introduction around the margin of Ardingly reservoir.

Pennyroyal is a classic plant of commons and village greens which are regularly disturbed by livestock who create the required habitat of open, broken ground containing holes and gullies which fill with water in winter. Its disappearance is the result of the loss of such habitats over most of the country, with the exception of the New Forest where it can still be found in reasonable quantity in a few places.

Nationally it is only present in any abundance in the New Forest where the trampling and grazing by cattle and horses that provide the required habitat is still widespread (Chatters 1994), and it is only known in about 25 10-km squares in the country. In the dry summer of 1995 it was found at a number of new sites in Northamptonshire, Cheshire, Lancashire and two in Wales, the low water levels possibly allowing flowering. The introduced forms tend to be more erect compared with the native form which is more prostrate.

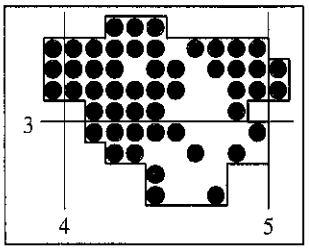
Now very local in southern England and scattered in west, central and southern Europe, North Africa and Macaronesia. Decreasing in England (Rich & Woodruff 1996).

****Mentha requienii.*** **Corsican mint.**



A tiny but strongly scented introduction, not previously recorded from our area, but now with a single record from a kerb stone on east side of Forest Road, Forest Row (439.346), pH 5.2, 1995, TR.

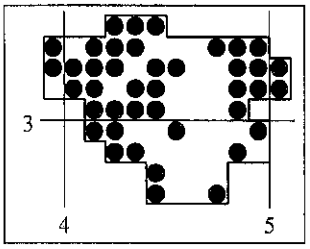
As its name suggests it is a native of Corsica and Sardinia. It occurs rarely in the Weald on woodland rides, and is rarely naturalized in Britain.



Callitriche is a difficult genus whose members are best identified from plants with fruits; useful illustrations are given in Stace (1991). Lack of fruits is usually given as the reason by most botanists for ignoring this genus, but careful searching of plants or populations shows that at least some are usually present, and young fruits can be matured on plants in jam jars on window sills. The map shows all *Callitriche* records.

Other than some *C. stagnalis,* which is the common plant of puddles on rides, virtually all records have been seen or checked by TR. All species are probably under-recorded in Sussex and Britain.

Callitriche stagnalis. **Common water-starwort.**

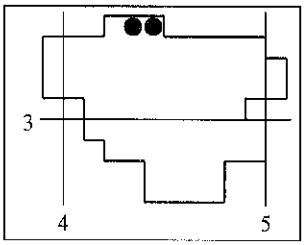


Common on the Forest (Hall 1980).

Common on wet rides in damp muddy depressions as an annual, and occasionally in water. Plants on the rides disappear by the end of the summer but can be found germinating in spring so there must be a seed bank in the mud.

Common in the Weald and widespread in Britain, the commonest species. Widespread in most of western Europe and North Africa.

Callitriche platycarpa. **Various-leaved water-starwort.**

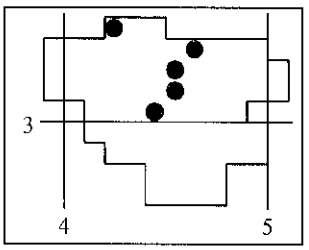


Ditches on old railway line, Forest Row (43.34 and 44.34), PW & TR, 1995.

These tend to be bigger more robust plants than *C. stagnalis* and have long, obvious stamens if you can find them flowering. Grime *et al.* (1988) note it may replace *C. stagnalis* in lowland waters enriched by agricultural run-off.

There are few Sussex records and it may indeed be quite uncommon. Probably widespread in lowland Britain. Possibly endemic to north-west and central Europe.

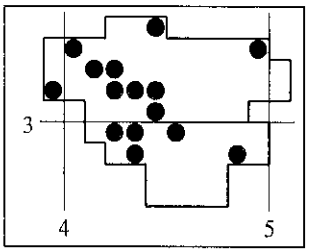
Callitriche obtusangula. **Blunt-fruited water-starwort.**



Lake at Forest Row (421.346); lakes and streams at Pippingford Park (44.30, 45.31); scattered down the stream running through Newbridge, and present as large mats in the water-splash (455.325); stream by bridge, Hart's Farm (461.332), all 1995, TR.

Usually in streams in more base-rich water and flowering/fruiting later than the other species. It is rarely recorded in Sussex but is surely widespread and is common in the fen areas of east Kent. Probably widespread in southern Britain, southern and western Europe and North Africa.

Callitriche hamulata. **Intermediate water-starwort.**



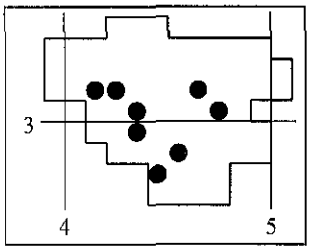
Pond on Ashdown Forest near Wych Cross (Whitwell 1902). Occasional on the Forest (Hall 1980).

Frequent in ponds and standing water which is clear and probably fairly acidic and nutrient-poor. Linear-leaved masses in the Medway seem to be this species, but grow mixed with an unidentified broad-leaved species.

Occasional in Sussex, and probably widespread in lowland Britain. Possibly endemic to north-west and central Europe.

PLANTAGINACEAE

Plantago coronopus. **Buck's-horn plantain.**



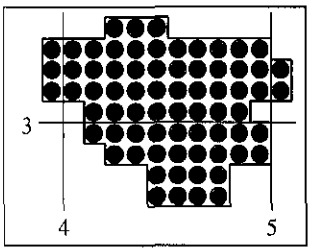
Near Wych Cross, Ashdown Forest (Coleman 1836). Tetrads 42J and 43F (Hall 1980).

We have recorded it mainly from the road verges and car parks along the A22 from Wych Cross to Millbrook, which relates to the previous records. It also occurs on verges at Gills Lap and King's Standing, and one plant was found on a verge in Nutley (443.274).

In Britain it is widespread around the coast and inland on acidic, freely-drained sands and gravels. It seems quite tolerant of drought, salt and pollution and can be found on the verges of many major roads such as the A4 in London and around the M25.

In Europe it is widespread around the coasts, and inland in the west and the Mediterranean region. It also occurs in North Africa and western Asia.

Plantago major. **Greater plantain.**



Ubiquitous in every tetrad in Sussex (Hall 1980).

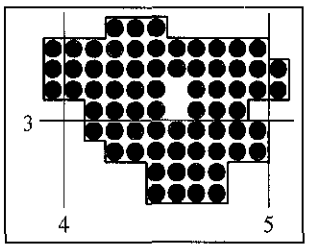
We have recorded it from all squares across the Forest in car parks, verges, tracks and pastures, usually on the damper, richer soils. It is very tolerant of trampling, and is frequent in lawns and playing fields. It is a variable plant, probably due to both environmental factors and genetic adaptation to different habitats.

Widespread in lowland Britain and almost throughout Europe, Asia and North Africa.

[***Plantago media.*** **Hoary plantain, Lamb's tongue.**

Tetrad 42T (Hall 1980). The occurrence of this species is a puzzle as it is most typical of grassland on chalk and calcareous clays in Sussex. It is found in some churchyards but is not in the one at Fairwarp in tetrad 42T, and we have been unable to refind it or even suitable habitat for it. Was it confused with *P. major*?]

Plantago lanceolata. **Ribwort plantain.**



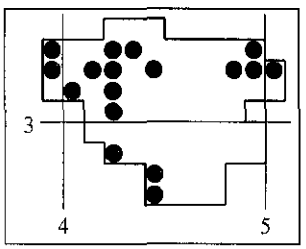
Ubiquitous in every tetrad in Sussex (Hall 1980).

We have recorded it from every square except two in the Pippingford Park area where it could occur in the pastures which have not been searched. It has a broad ecological range and occurs on a range of soils and grassland types.

It is one of the most widely recorded species in Britain (Rich & Woodruff 1990) and widespread in Europe, Asia and North Africa.

BUDDLEJACEAE

****Buddleja davidii.*** **Butterfly-bush.**



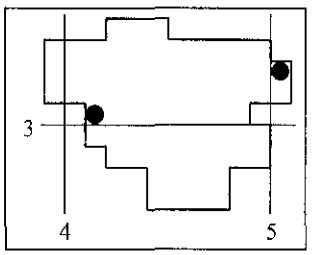
Tetrad 42N (Hall 1980).

We have many more records than Hall, from the villages where it is an escape from cultivation or a garden throw-out, and from waste ground and old fire sites in the Wych Cross area. It may be spreading. It is typically a calcicole in Britain and occurs on the richer soils or mortar associated with brickwork.

Widespread and increasing in England (Rich & Woodruff 1996). Native in China.

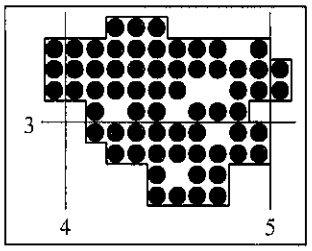
OLEACEAE

****Forsythia* × *intermedia.*** **Forsythia.**



Probably planted but not naturalized at Isle of Thorns (41.30), 1995, and St John's (50.32), 1994, both seen on Flora meetings. A hybrid which originated in cultivation.

Fraxinus excelsior. **Ash.**

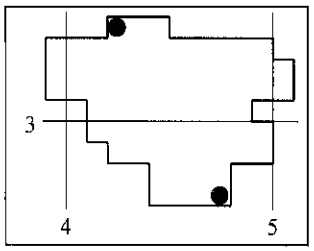


Locally frequent on the richer more calcareous soils, planted in hedges and scattered along the wet soils by streams, but rare elsewhere on the acidic soils and absent from the heathy areas. A number of the trees were frosted in April 1995, PD.

Recorded from 97% of the tetrads in Sussex (Hall 1980). Widespread in Britain, and in Europe, western Asia and North Africa.

The name 'Ashdown Forest' is nothing to do with ash trees. The earliest reference is to 'Aesca's hill fort', and the name is believed to have been derived from that. 'Forest' comes from the word 'Foris' meaning outside (i.e. outside the common law).

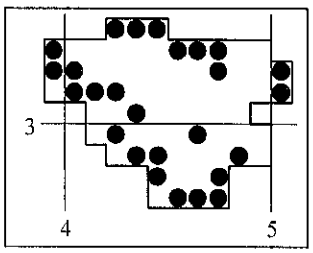
****Syringa vulgaris.*** **Lilac.**



One well-grown bush in scrub near house, Highgate (425.343), 1995, PW; one bush with suckers in woodland edge opposite Fairwarp Farm (472.266), 1994, TR & SR.

Increasing in England (Rich & Woodruff 1996). Native and endemic in south-east Europe, but widely cultivated.

Ligustrum vulgare. **Wild privet, Prim.**

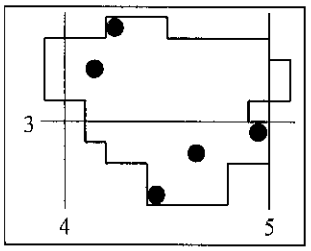


Frequent on the Forest (Hall 1980).

Recorded mainly around the Forest margins and verges, usually on the more calcareous soils similar to *Cornus sanguinea* and *Euonymus europaeus.* It usually occurs as a few scattered bushes, though it is more frequent in the Toll Lane area. During the mild winter of 1994/5 it retained its leaves until the spring.

It is widespread in lowland Britain on calcareous soils. South, west and central Europe and North Africa.

****Ligustrum ovalifolium.*** **Garden privet.**

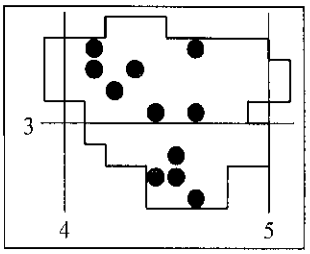


Five scattered records mainly near houses in the villages but also from waste ground, as near Wych Cross where it may be relict from cultivation.

Hall (1980) does not regard it as naturalized in Sussex. It is native in Japan.

SCROPHULARIACEAE

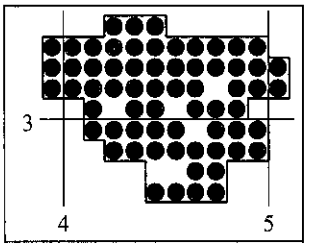
Verbascum thapsus. **Great mullein.**



Occasional (Hall 1980) and still scattered across the Forest, mostly in disturbed areas close to roads and tracks, and often as single plants most conspicuous when flowering. The large woolly leaves are also distinctive.

Common in Britain except in the north-west. Widespread in most of Europe, except in the far north, and in Asia.

Scrophularia nodosa. **Common figwort.**

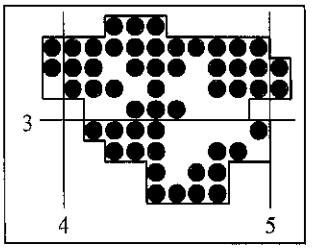


Common on the Forest (Hall 1980).

Common in damp, often rather shady places all over the survey area, frequently on road sides, track edges and by ditches. Like the following species it usually occurs as one or two, isolated, scattered plants. It is pollinated by wasps.

Widespread over much of Britain, Europe and temperate Asia.

Scrophularia auriculata. **Water figwort, Water betony.**

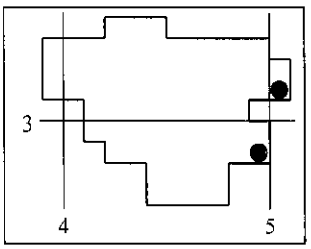


Common on the Forest (Hall 1980).

Slightly less common than *S. nodosa* with a preference for rather wetter habitats but not found in the most acidic conditions. These preferences probably explain its tendency to be rare on the higher ground.

Widespread in England and Wales but absent from much of Scotland. The European distribution is concentrated in the west, reaching as far north as the Netherlands, and it occurs in North Africa.

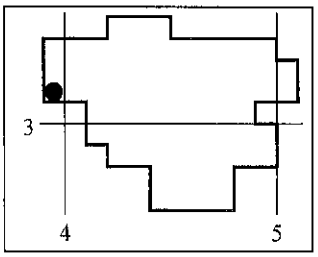
Mimulus* **agg. Monkey-flower.



The two records from the eastern edge of the Flora area are the first for the Forest although Hall (1980) has several records from adjoining areas, especially to the south-west. The records are from Newnham area (49.28), 1994, AK and the stream north of Ocklye House (500.313), 1991+, PW.

Mimulus is a critical genus and identifications need checking carefully (see Rich & Rich 1988). The Ocklye House plant has provisionally been named as *M. guttatus*, a native of North America.

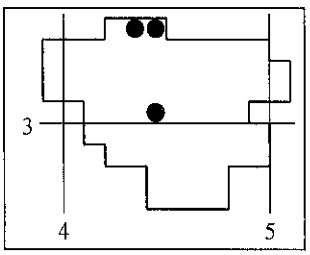
Antirrhinum majus.* **Snapdragon.



Twyford Farm, blatant garden throw-out on spoil (396.311), 1994, DB.

A garden escape increasingly recorded in England, especially on old walls (Rich & Woodruff 1996). Native in the western Mediterranean.

Chaenorhinum minus.* **Small toadflax.

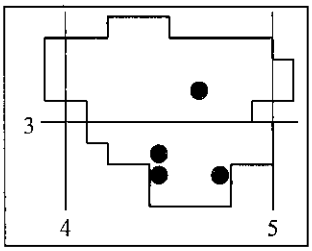


Tetrads 42Z, 43H and 43M (Hall 1980).

Two of our three records for this species are from the disused railway near Forest Row and correspond to the two tetrads shown in Hall (1980) for the north of our area. This was perhaps predictable as railway ballast is a common habitat for this plant, and until recent redevelopment it was abundant around the disused station in Forest Row just outside the Flora area. Our third record was from introduced limestone rubble on a turning area at Pippingford Park (456.312), 1995, Flora meeting.

Common over most of Britain as far north as the highlands of Scotland, and widespread in Europe and western Asia.

***Cymbalaria muralis.* Ivy-leaved toadflax, Creeping sailor, Mother of millions, Wandering Jew.**

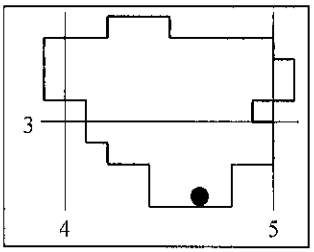


Occasional on the Forest (Hall 1980).

We have four records for this long-established introduction, three from walls which are its favoured habitat, and one from Gills Lap where it occurred on the ground in the car park area. Hall (1980) has records for three tetrads in our area but the only one which corresponds to our records is for Nutley. Coleman (1836) recorded it from the yard of the Dorset Arms in East Grinstead where it was still present in 1995.

A native of southern Europe, now widely naturalized on damp walls etc., in Britain, which matches its native habitat as a calcicole of shady rocks and woods. Once fertilised, the stalks of the flowers turn away from the light and push the fruiting capsules into crevices where the seeds can grow in a sheltered environment.

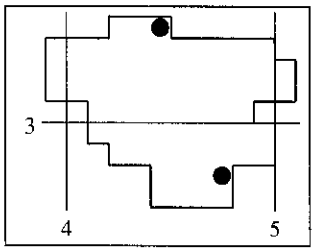
***Kickxia spuria.* Round-leaved fluellen.**



One seedling behind the seat outside the village hall at Fairwarp (466.263), 1995, PD & RN, presumably from mud kicked off a boot; it had gone by the autumn possibly when the car park was renovated.

K. spuria is significantly scarcer in Sussex than *K. elatine* and more calcicolous, and the distribution in Hall (1980) shows very few records for the north-east of the county so this record was a pleasant surprise although its chances of becoming established in the area must be rather slim. Common in southern, central and western Europe, and North Africa.

***Kickxia elatine.* Sharp-leaved fluellen.**

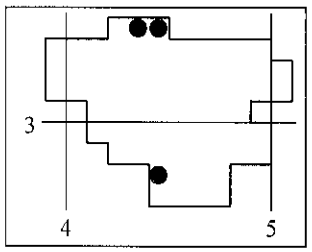


There is a record from Chelwood, 1939, G. E. Shaw (**TLS**) but the distribution map in Hall (1980) shows it is distinctly rare on the Ashdown Sands around the Forest.

We now have two records: one large plant by a planted tree at Oldlands Hall on what looked like local, not introduced, soil (476.277), 1995, RN *et al.*; one plant in stubble, Line's Farm (446.348), 1995, TR.

Confined to the south of England; as far north as Lincolnshire in the east and occasional in Wales. Common over much of southern, central and western of Europe.

***Linaria vulgaris.* Common toadflax, Butter and eggs, Brandy-strap, Gallwort.**

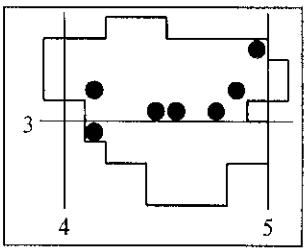


Rare, only found in a few waste places by habitation around the Forest, just as expected from the distribution shown in Hall (1980). Much of our area is probably too acidic and wet for this species which, in Sussex, is clearly commonest on the chalk and drier western Greensands.

It forms patches in open ground and on verges by the rhizomes which spread under the ground. Isolated clones may not set seed as it is self-incompatible.

Widespread in lowland Britain and Europe and western Asia.

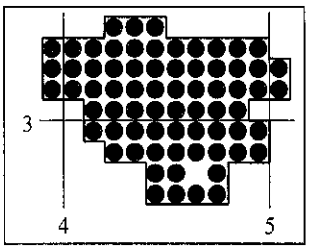
***Linaria purpurea.* Purple toadflax.**



Like many introduced species, our data indicate that purple toadflax is rather more widespread than in the past. Wolley-Dod (1937) regarded it as rare in Sussex and gave a single record in our area: Marden's Hill, G. Marshall. Hall (1980) states that it is becoming more frequent and recorded it in two of our tetrads, 43H and 43V. We have seven records from disturbed or man-made habitats where it has been thrown out of gardens or spread by seeds.

Increasing in England (Rich & Woodruff 1996). It is native in southern Italy.

Digitalis purpurea. **Foxglove, Dragon's mouth, Lion's mouth, Finger root, Tiger's mouth.**



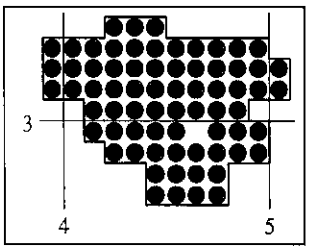
Ashdown Forest, 1893, T. Hilton (**BTN**). Common on the Forest (Hall 1980).

Recorded in all but one of our 1-km squares, which may be due to an oversight in our recording but, as a number of different recorders have visited that area and missed what must be one of our most conspicuous plants, it is clear that it must at least be extremely scarce in that area. Very obviously at home on the acid soils of the Forest (as it is in the Weald), generally found in rather open areas, on heathland or in clearings in woodland, sometimes where burning has occurred. It can be quite spectacular in places where many plants are in full flower, and the flowers are often busy with bees.

Digitalis purpurea is only found on soils of low pH in Britain where the climate is cool, but in warmer regions of continental Europe it occurs on soils of higher pH; this phenomenon can be replicated experimentally (Woodward 1987).

It is widespread and increasing in England (Rich & Woodruff 1996). It is widespread in western Europe but becomes much rarer eastwards, and occurs in Morocco.

Veronica serpyllifolia. **Thyme-leaved speedwell.**

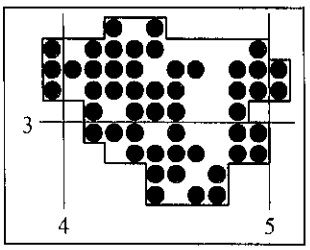


Common on the Forest (Hall 1980).

Virtually ubiquitous, matching the frequency shown in Hall (1980). Found in damp grassy areas, on the heathy rides and as a weed in disturbed ground. It persists in shaded rides but rarely flowers.

Veronica serpyllifolia is a very widespread species, occurring throughout Britain and in Europe, Asia, Africa and the Americas. It is increasing in England (Rich & Woodruff 1996).

Veronica officinalis. **Heath speedwell.**

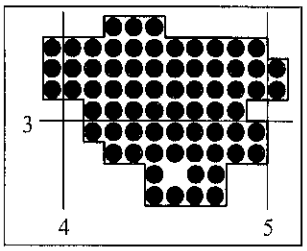


Rather more common in our survey than the map in Hall (1980) indicates, which is almost certainly due to the more intense recording. It often occurs in the Forest on low banks and at the edge of rides, around the edges of grassy patches and occasionally in open heathland.

Most typical of acidic, nutrient-poor, freely-drained soils in open conditions. When shaded it does not grow well and may be eaten by slugs (Dale & Causton 1992a, b).

Decreasing in England (Rich & Woodruff 1996). Widespread in Europe and Asia Minor.

Veronica chamaedrys. **Germander speedwell, Blue bird's-eye.**

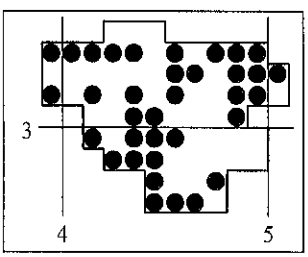


Recorded as ubiquitous by Hall (1980) and equally common in our survey only missing from one square. Most often found at the base of hedges, on road verges and in open areas of woodland. It occurs on a range of soil types but is badly affected by water-logging.

This species requires a long period of vernalization before it will flower, and will not flower in its first year. It is an obligate out-breeding species and has low seed set. Its persistence in grassland may depend on clonal growth rather than repeated establishment from seed (Boutin & Harper 1991).

It is a very widespread plant, occurring across the whole of the British Isles, throughout Europe, over much of Asia, and in West Africa.

Veronica montana. **Wood speedwell.**

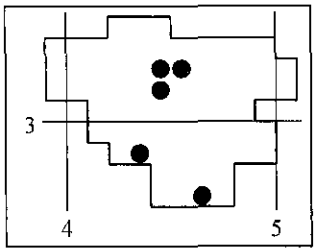


Scattered along the river valleys and around the Forest with a frequency similar to that shown in Hall (1980). It occurs mainly in and around old, natural woodland, often near rivers, and is absent from the main areas of heathland.

It grows on moist soils which are weakly acidic to weakly base-rich in pH, and intermediate to rich in soil nutrients. It tends to be confined to woodlands as it cannot tolerate high light levels (Dale & Causton 1992a, b).

It occurs in west, central and southern Europe and the North African mountains.

Veronica scutellata. **Marsh speedwell.**



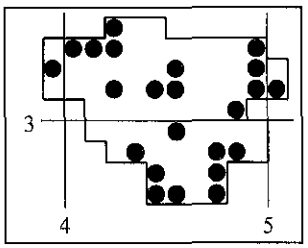
Ashdown Forest, N. J. Treutler, 1886 (Arnold 1887). Near Fairwarp, E. D. Morgan; bog near Coleman's Hatch, H. S. Salt (Wolley-Dod 1937). Tetrad 43L (Hall 1980).

We have five records for *V. scutellata* during our survey, which is rather more than in previous floras: pond margin at Mill Wood (437.288), 1995, MM; Pippingford Park (44.31), 1995, Flora meeting; Ridge Road pond (447.329), 1994, PW; many plants in flower along ditch east of water splash, Newbridge (456.326), 1995, PW (corresponding with Hall's tetrad 43L record); shaded bog by road junction, Fairwarp (465.264), 1995, PD & RN.

This rather attractive speedwell is characteristic of wet places and is easily distinguished as the racemes of flowers emerge from one side only of each pair of leaves. Although widely scattered over the whole of Britain and Ireland, *V. scutellata* is rather uncommon in Sussex and is decreasing in England (Rich & Woodruff 1996) so it is pleasing to see that it is certainly holding its own in our area.

Widespread in Europe except the south, and in northern Asia.

Veronica beccabunga. **Brooklime.**



Scattered across the Forest in wet places and stream edges but not found in the most acidic conditions. The frequency is similar to that in Hall (1980) whose map shows that *V. beccabunga* is less frequent in our area than in many other parts of Sussex.

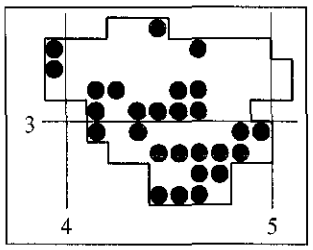
Brooklime and cresses were once popular remedies for scurvy and were recommended in Culpepper's herbal in 1653 as "good to fasten loose teeth and heal spongy foul gums".

Widespread in Europe except the north, North Africa and temperate Asia.

Veronica anagallis-aquatica. **Blue water-speedwell.**

Hall (1980) has a single tetrad record from 43L but no plants were found in this survey. It is a fairly widespread species in Britain, and around the world.

Veronica arvensis. **Wall speedwell.**



Common on the Forest (Hall 1980).

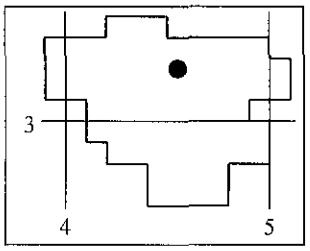
Present across the centre and southern parts of the Forest, as shown in Hall (1980), but absent from much of the north. This is because this annual generally prefers drier, open habitats such as old walls, car parks and limestone rubble in Pippingford Park, which are less common on the north side of the Forest. The seeds will only germinate in the light, which is probably an important factor limiting it to open sites. They also have a complex temperature control mechanism to ensure that they only germinate in the spring and autumn (Baskin & Baskin 1983). It seems to behave as a winter annual in most places on the Forest, flowering from May onwards, but in arable land cultivated in the spring it may be a summer annual.

Widespread in Britain and increasing in England (Rich & Woodruff 1996). Native in Eurasia, but now widely spread throughout the world and a serious weed in some countries.

****Veronica peregrina.*** **American speedwell.**

A rather scarce introduction from America, not found during our survey but shown as present tetrad 43W in Hall (1980). It is widely naturalized in west and central Europe.

Veronica agrestis. **Green field-speedwell.**

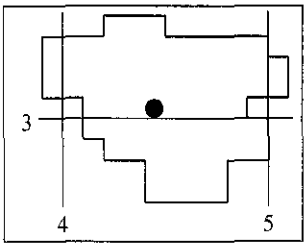


Tetrads 42Z and 43H (Hall 1980).

One plant on wall of bridge at Newbridge Mill (456.328), 1995, TR & SR. This site was a very odd habitat for a species which usually occurs as an arable weed or in gardens, and is often more of a calcifuge.

Veronica agrestis is a rather uncommon plant over much of Sussex and may well be declining in the county. It is widespread in Europe, Asia Minor and North Africa.

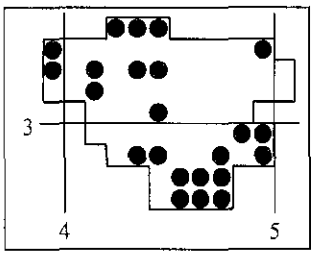
Veronica polita. **Grey field-speedwell.**



Rare, with only a single record from dumped soil near Home Farm (444.303), 1993, Flora meeting, which is not in the same area as the single record for tetrad 33V given in Hall (1980). This lack of records is simply a reflection of the scarcity of suitable arable habitats in the Flora area.

It is widespread in Europe, temperate Asia and North Africa.

****Veronica persica.*** **Common field-speedwell.**

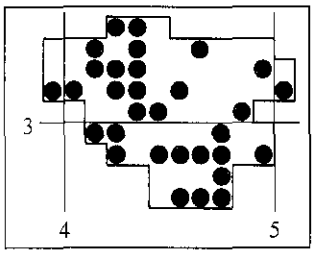


This plant is now so frequent, it is easy to forget that it is an introduction from south-west Asia which Arnold (1887) noted was spreading rapidly. Shown as common by Hall (1980) but less so in our area than anywhere else in Sussex, a picture confirmed by our survey which produced records for less than a third of the squares recorded. The reason is that waste ground, cultivated land and gardens, its preferred habitats, are relatively uncommon on the Forest.

Seeds germinate rather sporadically through the spring, autumn and summer, and they may be killed by frost in severe years. This is one of the first species to flower in the spring, but seed set is generally low at first (Boutin & Harper 1991).

It is native in western Asia, and is naturalized almost throughout Europe.

****Veronica filiformis.*** **Slender speedwell.**



An escape from gardens described as rare by Wolley-Dod (1937) who gives a single record for our area; near Fairwarp, E. D. Morgan. Within forty years it had become common and well established (Hall 1980), and it is increasing in England (Rich & Woodruff 1996).

Our data might be thought to show a further spread as Hall shows it to be present in 11 of the tetrads which fall in our area whereas our 31 1-km square records fall in 18 tetrads but the difference can also be explained by the more intense recording in our survey (see *Veronica hederifolia* below).

Slender speedwell occurs in grassy places and, where it is well-established, can produce a rather attractive blue haze in lawns during the spring, a feature not always appreciated by their owners! It is strongly self-incompatible and little seed is set as many populations are clones.

It is native in Turkey and the Caucasus.

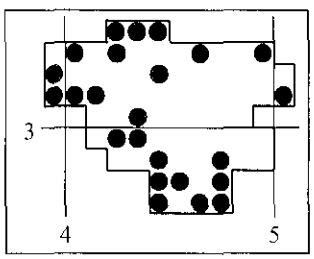
Veronica hederifolia. **Ivy-leaved speedwell.**

Our survey indicates that *V. hederifolia* is significantly more common in our area than the distribution map in Hall (1980) would suggest. It seems unlikely that the frequency of this widespread plant has increased significantly over the last twenty years on the Forest so the difference is probably a result of the more intense spring recording which occurred during our survey. Rich & Woodruff (1995) found that it is increasing in England.

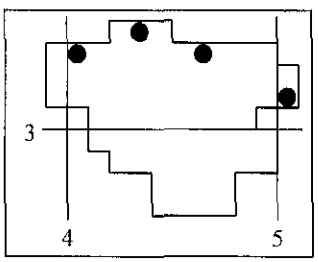
Both subspecies are present but the records are too fragmentary to draw much in the way of conclusions from them. The smaller plants of shady places in woodlands are subsp. *lucorum*, and the more robust weeds of gardens and waste ground are subsp. *hederifolia*; the former appear to be more frequent.

V. hederifolia occurs as a weed in gardens and other cultivated ground and also in hedgebanks and woodland edges. Seeds germinate in the autumn and early spring and the seedlings survive through the winter. Nationally the distribution has a distinct bias toward the south-east of England. It is widespread in Europe, North Africa and Asia, and occurs in North America as an introduction.

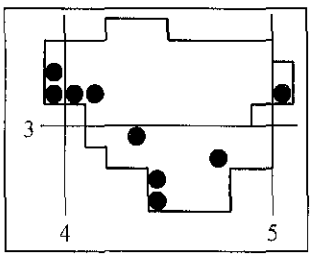
Veronica hederifolia



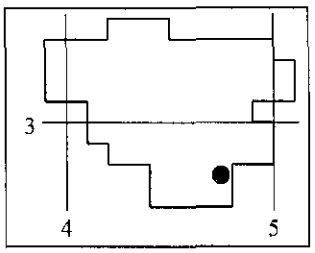
subsp. *hederifolia*



subsp. *lucorum*



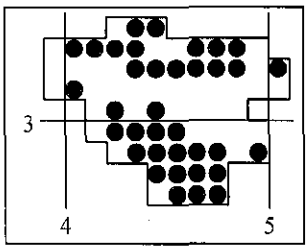
Sibthorpia europaea. **Cornish moneywort.**



Found by RN *et al.* in full flower, July 1995 at Oldlands Hall (476.275). About seven large patches of the moneywort were growing in damp grassland and on shaded banks by the rockery stream where they may have been introduced, but from where? The rockery stone is probably local sandrock from Heron's Ghyll, or it could have been introduced with some of the rockery garden plants such as *Lysichiton* or *Osmunda*. It is known as a native a few miles to the south in tetrad 42S (Hall 1980). Further investigation is required.

Sibthorpia is one of the small group of plants like *Wahlenbergia hederacea* and *Hymenophyllum tunbrigense* which is confined to the west of Britain except for a few sites in Sussex. It is a Nationally Scarce Species recorded in 74 10-km squares since 1970 (Stewart, Pearman & Preston 1994). Colonies are reduced in size during summer droughts but grow back from surviving fragments. They may also be defoliated by severe winter cold. Its world-wide distribution is disjunct with populations along the western edge of Europe, Greece and Crete and the mountains of tropical Africa.

Melampyrum pratense **subsp.** ***pratense.*** **Common cow-wheat.**



Ashdown Forest, 1895, T. Hilton (**BTN**). Fisher's Gate (as var. *lanceolatum*), E. C. Wallace (Wolley-Dod 1937). Common on the Forest (Hall 1980).

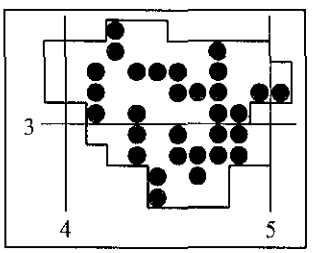
Locally frequent in open woodlands and wood edges where there is more light, for instance along the edge of the Royal Ashdown golf course, and by paths and road banks such as along Priory Road or Kidd's Hill. It is able to colonise secondary woodland from older woodland and our map may show a slow process of invasion into the Forest from the edges. It is sensitive to grazing and is virtually absent from Pippingford Park where there are deer.

M. pratense is an annual. The seeds germinate at low temperatures in the spring, and sheets of seedlings may appear in some years, as in 1995. The plants are hemi-parasites, their roots attaching themselves to the roots of other species and absorbing water and nutrients. Plants can grow without parasitising other species but are usually poorly developed and much smaller.

The seeds have a small oil-bearing body, an elaiosome, which is attractive to the ants, who pick up the seeds and carry them off (experimental removal of the elaiosome significantly reduces their attraction to the ants). Seeds are shed during the day when the majority are removed, leaving few to be eaten by small mammals at night. Studies of an American species *M. lineare* show that seeds dispersed by ants survive and grow better than if they fall at random, possibly because the ants move them into better-lit places (Gibson 1993). This presumably explains why the plants are so much more frequent along tracks and banks where the microclimate is more suitable for the ants.

It is a widespread and very variable species in Europe and western Asia.

Euphrasia officinalis **aggregate. Eyebrights.**

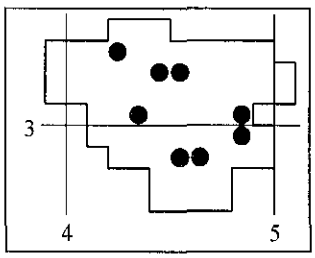


On the forest (Firmin 1890).

Eyebrights are a critical group and can present considerable difficulties in identification in areas where a number of species occur. Fortunately (or unfortunately, depending on your point of view!) only two species of *Euphrasia* have been seen recently on the Forest and these are relatively easy to separate; *E. anglica* is readily distinguished from *E. nemorosa* by the long-stalked glandular hairs, which are easily visible in silhouette with a ×10 lens on the middle and upper leaves. Records for ***E. micrantha*** (*E. latifolia* var. *gracilis*), Ashdown Forest, 1901, T. Hilton (**BTN**) may be *E. nemorosa* but need confirming by an expert.

Eyebrights are declining due to agricultural improvements (Rich & Woodruff 1996).

Euphrasia anglica. **Eyebright.**

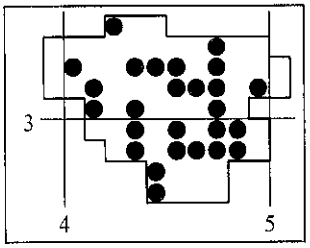


Chelwood Gate/Chelwood Common, 1934, A. H. Wolley-Dod, det H. W. Pugsley (**TLS**); Near Wych Cross, E. Ellman; Ashdown Forest, T. Hilton, det H. W. Pugsley (Wolley-Dod 1937). Occasional on the Forest (Hall 1980).

Found mainly in short grass, often on road verges and rides. Our records are thinly scattered across the Forest although in some places it is locally common, as for example along the verges on the south side of the road between Nutley and Camp Hill, where it can be seen growing with *Spiranthes spiralis*, an unusual combination.

Possibly endemic to the British Isles, locally frequent in England and Wales and more rarely in Ireland.

***Euphrasia nemorosa*. Eyebright.**

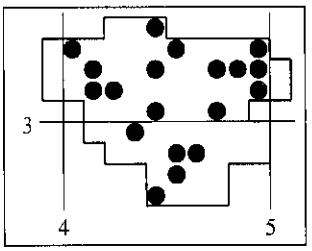


Common (Hall 1980).

This is the commonest eyebright on the Forest, widely spread along verges, rides and in grassland. Plants with pinky-purple flowers occur in a number of populations (e.g. Millbrook Hill, Millbrook Farm, Duddleswell) which have been suggested to be *E. micrantha* (also reported from Crowborough Common), but they otherwise conform to *E. nemorosa* and are best treated as that (A. J. Silverside, pers. comm. 1994). Whether the flower colouration is relict from hybridisation with *E. micrantha* or not remains to be seen.

Widespread in England and Wales but becoming scarce in Scotland. Endemic to north and central Europe as far south as the north-east of Spain.

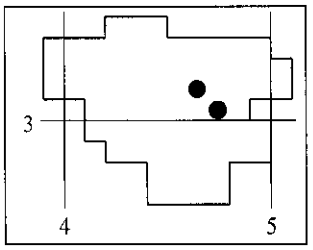
***Odontites vernus*. Red bartsia.**



We have significantly more records than Hall (1980) who shows it in only four tetrads in the Forest, probably due to our more intensive coverage of the area. It is found in a variety of habitats, in grassy areas, waste places, by tracks and rides. We have not investigated which subspecies occur.

Widespread in Britain, and in most of Europe and northern Asia.

***Rhinanthus minor*. Yellow-rattle, Penny-rattle.**



Only recorded from two places in the east of the Forest: verges by Gills Lap car park (466.315), 1987, 1993, PW; King's Standing (473.301), 1995, Flora meeting. It may be on the verges where limestone dust from the roads has spread making the soils more calcareous. It is a lot scarcer than would be expected from the distribution shown in Hall (1980) who has records from six tetrads, none of which correspond to our records.

R. minor is indicative of undisturbed grassland and is still common on chalk in Sussex but becoming scarcer elsewhere. The reason for the apparent decline in the last 20-30 years may be the continued loss of old grassland to agricultural improvements.

This is another annual hemi-parasite whose roots have been recorded attached to over 50 different hosts, mostly grasses and legumes. It often occurs in patches and the areas around the plants have a shorter, more open sward structure and fewer grasses due to the effect it has on its hosts. It is also sensitive to grazing and can be rapidly eliminated from swards, where it would otherwise become a pest.

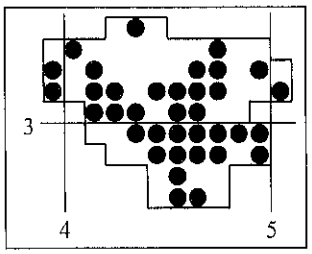
It is a very variable species and is widespread in Britain and Europe. It also occurs in Greenland and North America.

***Pedicularis palustris*. Marsh lousewort.**

Fisher's Bog [probably near Fisher's Gate], Dr Milner Barry (Deakin 1871). Ashdown Forest, TWNH (Wolley-Dod 1937).

Not seen during the survey for Hall (1980) and last seen in Sussex on the Lewes Levels, 1932, Ron Boniface (the record Willard 1989 is an error for *P. sylvatica*). It is a species of wet mineral or peaty flushes. Decreasing in England (Rich & Woodruff 1996), but still reasonably widespread in south-west Surrey, the New Forest and north-west Britain. It is quite widespread in Europe.

***Pedicularis sylvatica* subsp. *sylvatica*. Lousewort.**



Common on the Forest (Hall 1980).

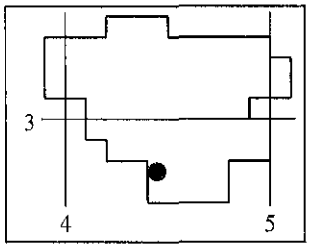
Our distribution map shows it to be mainly concentrated on the southern slopes of the Forest in open areas. It is locally frequent on rides and grassy places on heathy soils, the pink flowers a pleasant sight in early summer. All material examined has had glabrous calyces and is subsp. *sylvatica*. It is a biennial which is often abundant after fires.

It is another hemi-parasite, thought to parasitise the roots of grasses. MM has carried out experiments on its germination (*Pedicularis* has the reputation of being almost impossible to grow from seed). *P. sylvatica* was found to germinate readily but the numerous seedlings died gradually. In only one case, using *Agrostis* as the host, has a plant been produced which has flowered.

Widespread and locally common in the north and west of Britain. It is decreasing in England (Rich & Woodruff 1996). Subsp. *sylvatica* is endemic to Europe, and occurs in west and central Europe from Spain to Sweden and Russia.

OROBANCHACEAE

Orobanche rapum-genistae (O. major). **Greater broomrape.**



Chelwood Common, N. J. Treutler, 1886 (Arnold 1887). Near Nutley, on Broom, W. E. Nicholson (Wolley-Dod 1937). Near Nutley, 1957, R. A. Boniface (BRC).

Refound just west of Chestnut Farm (44.27) in 1994 and reported to the Rangers by a local resident. One plant beside a minor path had two flowering spikes in 1994 and three in 1995, but an adjacent plant in 1994 did not flower again, and another plant by the track with three spikes in 1994 also did not flower again in 1995.

O. rapum-genistae is a root parasite of both broom and gorse, and all the plants were associated with broom (the usual host). As both broom and gorse are frequent on the Forest its scarcity might seem surprising but this is typical of its behaviour nationally.

It is a plant of western Europe and, in Britain, occurs most often in the south and west. It suffered a considerable decline between the turn of the century and the early 1960s, especially in the east of the country (Rich & Woodruff 1996). Foley (1994) suggests that climatic changes may be the main cause of the decline in the early part of the century. However, there must have been a major loss of small patches of gorse and broom in most of England and it survives now only where those are still relatively frequent; habitat loss is a more likely explanation.

It mainly occurs in western Europe, reaching its northern limit in Scotland. It also occurs in North Africa.

Orobanche minor. **Lesser broomrape.**

Tetrad 43R (Hall 1980).

Presumed extinct. Not found during our survey despite being the commonest broomrape in East Sussex with recent records from nine 10-km squares in the county and it has for instance appeared in abundance on clover sown on the new A27 Brighton bypass. It is decreasing in England (Rich & Woodruff 1996). It occurs in Europe, Asia Minor and North Africa.

LENTIBULARIACEAE

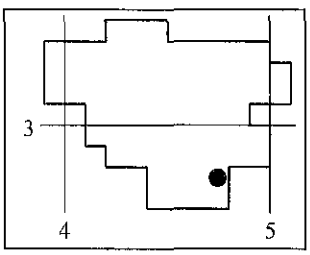
Pinguicula vulgaris. **Common butterwort.**

Ashdown Forest, 1894, E. G. Gilbert; Crowborough, 1922, Miss H. C. Underhill (possibly the same locality) (Wolley-Dod 1937). Ashdown Forest, Miss E. M. Harding and members of the Tunbridge Wells Natural History Society "a notable discovery" (Harding 1932). Notes in G. Dent's diary states that A. Morriss found it in Pippingford Park near gentians close to a small gate, and that gentians flowered on 29 July 1945 near the *Pinguicula* place - no further details are given (Dent 1928-1953).

This 1932 record was the last record (misquoted by Hall 1980), and has almost certainly gone. It has been searched for since by many others including FR, to whom Wolley-Dod gave two different sites; whether it was in one or both we shall never know.

It is widespread in north and western Britain, but is now very rare in the south and east due to agricultural improvements and habitat loss. Ashdown Forest was the most south-easterly site in Britain and it is now extinct in south-east England. Widespread in north, west and central Europe, northern Asia, North Africa and North America.

****Utricularia australis.*** **Bladderwort.**

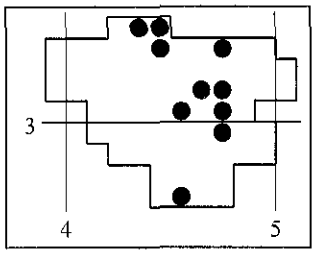


Plants flowering in an ornamental pond at Oldlands Hall (476.275), 1995, TR *et al.*, must have been introduced with other aquatics.

This species occurs scattered in Sussex, especially in the wetland areas such as Amberley Wild Brooks. It is probably widespread but scattered in Britain and Europe.

[*Utricularia minor.* Lesser bladderwort.
The record in Streeter (1961) appears to be a misunderstanding of an R. A. Boniface record for Chailey Common.]

***Campanula rotundifolia*. Harebell.**

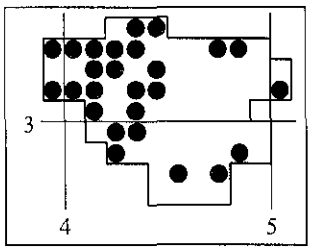


On the Forest (Firmin 1890). Shepherd's Gate Farm, 1954, P. A. Barker (BRC). Frequent on the Forest (Hall 1980).

We have found harebells to be surprisingly uncommon, with very few records mostly from the east side of the Forest. There are 3-4 beautiful large blue patches on verges on east side of Gills Lap (467.316) which escaped the mowing in 1995, at least for long enough to be noticed; a few scattered plants occur on the golf course fairways which are only conspicuous when flowering and also get mown off soon after; and it occurs in grassland where it is still grazed at Chuck Hatch (474.332). It also occurs scattered on a few other verges, and appears sporadically depending on the mowing.

In Sussex it is common on the chalk, and is also surprisingly frequent in the St Leonard's area. It is widespread in Britain but becoming uncommon in the lowlands. In Europe it is a very variable species.

***Wahlenbergia hederacea*. Ivy-leaved bellflower.**



On the bogs of Ashdown Forest, very common (Forster 1816). Bogs on Ashdown Forest (Coleman 1836). Reported in bud in June 1902 (Clark 1903). Plentiful on some of the bogs on Ashdown Forest near Old Lodge, also in Five Hundred Acre Wood (Done 1914). Many parts of Ashdown Forest (Wolley-Dod 1937). Common with 17 tetrads (Hall 1980).

Our records show it to be most frequent along in the western half of the Forest, in contrast to *Campanula rotundifolia*. It typically occurs on damp, partly shaded, clayey rides in woodland, or the banks of small streams and in ditches, and sometimes in damp, open grassland. It even occurs on wet clay on a grave in St John's churchyard. The soil pHs recorded range from 4.4 to 6.7. Once the habitats are learnt it is usually possible to pick out from a distance likely spots to search.

The damp summer of 1994 appeared to be a very good year for it, with many records of large conspicuous patches, and some plants stayed green through the mild winter of 1994/5. The 1995 drought did not seem to affect it too much, and plants flowered right through the drought and set abundant seed - admittedly they were generally in the damper areas anyway. The damp soils on which it occurs in the Weald substitute for the damper climate it experiences in the west of Britain.

In Sussex it is locally frequent in Ashdown, Worth and St Leonard's Forests, and it is very rare in the Kent Weald. In Britain it mainly occurs from Hampshire into south-west England (where it is decreasing Rich & Woodruff 1996) and Wales. Studies of the genetics in Wales have shown that populations are quite variable both within and between sites (Kay & John 1995). It is a western European endemic from Portugal to south-west Scotland.

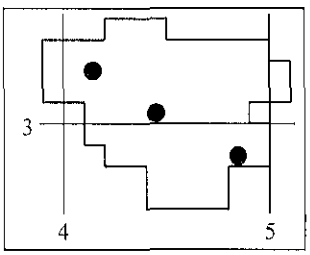
***Jasione montana*. Sheep's-bit.**

Dodd's Bank, near Nutley, M. R. Dixon, 1886 (Arnold 1887). Fairwarp area, 1956, P. A. Barker (BRC). Near Nutley, 1957, R. A Boniface (BRC). Tetrad 42N (Hall 1980).

This plant was last seen by PD at Dodd's Bank on the east side of the road at c. (449.267) in the 1970s, but the area is now over-grown and it has not been refound. Dodd's Bank is one of the few areas on the Forest which has sandy soil on which it typically occurs in south-east England. If the area was cleared it could reappear from seed in the soil, a phenomenon which has happened at Midhurst Common in Sussex. It has also been recorded from just outside the area on rocks near Maresfield (462.257), 1957, FR & C. A. Stace.

It is a rare and declining plant of heaths in Sussex and England (Rich & Woodruff 1996), and is strongly western and now largely coastal in distribution in Britain. It is a variable species in Europe (Parnell 1987) and is widespread except in the north.

****Lobelia erinus*. Garden lobelia.**

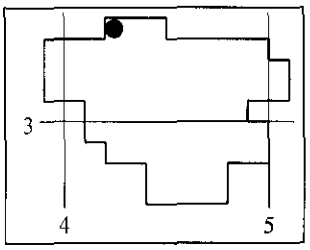


Waste ground at Wych Cross (419.320), 1993, TR; imported soil near Home Farm (444.316), 1993, Flora meeting; near houses, Poundgate (487.288), 1994, SBRS.

This garden escape has been recorded as a non-persistent weed usually on dumped soil. It is increasingly recorded in England (Rich & Woodruff 1996). It is native in South Africa.

RUBIACEAE

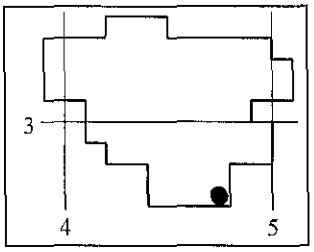
Sherardia arvensis. **Madder.**



Three big clumps and one small one, introduced with soil on new verge, Highgate Green (423.343), 1986-1988, PS. Now gone, though it could possibly reappear if the verge was disturbed again.

An arable weed on the chalk in Sussex, and occasionally recorded in the Weald. It is widespread but decreasing in England, especially in the north (Rich & Woodruff 1996). It is found over most of Europe, North Africa and western Asia.

Galium odoratum. **Sweet woodruff.**

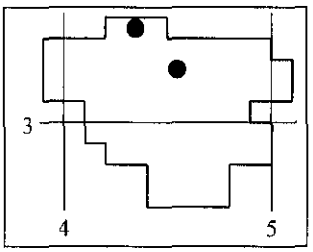


Tetrad 42T (Hall 1980).

It occurs scattered down the stream on the more calcareous clays from the banks along the lane east of Oldlands Farm (477.267), 1993+, SBRS, southwards through Furnace Wood (various sites, 475.267, 473.263), 1995, TR *et al.,* where it is clearly native. It is also creeping out of the back of Gate Cottage, Twyford (399.312) where it was planted, 1994, DB (not mapped).

Most commonly found in old woodland on base rich soils so its scarcity on the Forest is no surprise. It is locally frequent on the chalk in West Sussex and on the Weald Clay in the Weald. Common over much of Britain, and in Europe and North Africa.

Galium uliginosum. **Fen bedstraw.**

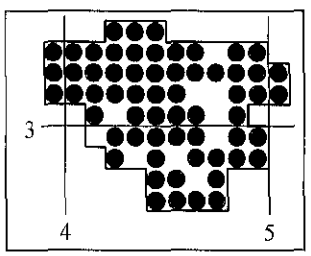


The record for "*Galium erectum,* bog in Pappingford Warren, Ashdown Forest, in the corner next to Gills Lap" (Coleman 1836), may refer to this species. Wolley-Dod (1937) has one definite record for the Flora area from Coleman's Hatch, H. S. Salt and another which may be within the Forest - near the mineral spring, Hartfield, E. Jenner. Tetrad 43L (Hall 1980). There is an unconfirmed record for the ghyll by Lavender Platt (404.332), 1988, AFRR.

In August 1994 AK found a small group of plants in a wet area beside the boggy wood at Newbridge (457.325) where the ground water pH is around 6.0. The plants were noticed on a very dull, drizzly day because the flowers were pure white and stood out clearly in the dim light at the edge of the wood. In August 1995 the area was much drier and more overgrown and no *G. uliginosum* could be found. It was also found with *Cardamine amara* and *Viola palustris*, on the edge of the golf course at Forest Row between the pond and the boundary (346.342), 1987, PS. TR and PS revisited the site in 1995 to find that the area had been half covered in sludge bulldozed from the pond and no *G. uliginosum* could be found. Decreasing in England (Rich & Woodruff 1996).

G. uliginosum is widely distributed in Europe. It occurs widely in England and southern Scotland but is distinctly scarce in Wales and northern Scotland. Hall (1980) shows it as thinly scattered in Sussex with records from 26 tetrads in East Sussex. However, ours are the only recent records from East Sussex, indicating a significant decline in the last 20 years, which may well be due to the loss of wetland habitats due to drainage or in-filling of ponds.

Galium palustre. **Common marsh-bedstraw.**



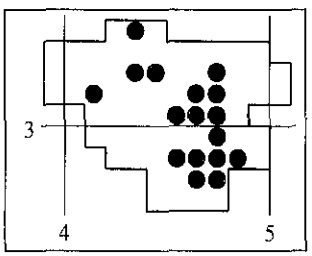
Common on the Forest (Hall 1980).

Widespread and common in damp flushes in grassland, beside ponds and streams and in woodland. Sometimes it fills the air with scent when flowering profusely, as at Newbridge.

It is very variable, some plants with practically linear leaves and smooth fruits. Both subsp. *palustre* and subsp. *elongatum* have been recorded but it may not be possible to separate them morphologically (Rich & Rich 1988).

Common over the whole of the British Isles and most of Europe.

Galium verum. **Lady's bedstraw.**

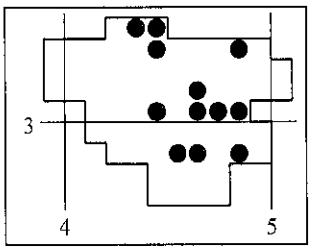


Apparently absent from the area in Hall (1980) but recorded in tetrads just beyond the south-east corner of the edges of the Forest.

Recorded from road verges mainly in the Gills Lap - King's Standing area, and the yellow patches were very much more conspicuous in 1995 when the verges were mown late. This indicates that it was probably under-recorded in this area in the past so it may be commoner in other parts of East Sussex than is indicated by the map in Hall.

Scattered over most of the British Isles but decreasing in England (Rich & Woodruff 1996). Present over most of Europe and western Asia.

Galium mollugo. **Hedge bedstraw.**

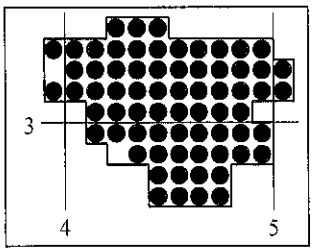


Occasional on the north side of the Forest (Hall 1980).

We have found it in 12 of our squares scattered on the Forest but the match between ours and Hall's distributions is rather poor. It is usually found either on verges in the central area, or in hedges and hedgebanks around the Forest edges.

Common in Britain south-east of a line from the Humber to the Severn and again in a band from the Lake District north-eastwards. The European distribution is unclear because of ambiguities in the treatment of *G. mollugo* and *G. erectum (G. album)* although plants from the *G. mollugo* group are found across the whole of Europe.

Galium saxatile. **Heath bedstraw.**

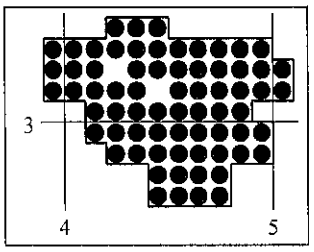


On the Forest (Firmin 1890). Common on the Forest (Hall 1980).

Our survey found it in all but two squares on the extreme western edge of the area. It is a characteristic plant of heathland and acidic grassland and may often be found in acidic areas where the number of species present is rather low. Young plants often have the leaves in whorls of four rather than six, but have reflexed hairs on the leaf margins.

Common throughout Britain but strictly calcifuge. Present in most of Europe except for some areas in the south, and found in Newfoundland.

Galium aparine. **Cleavers, Goose-grass.**

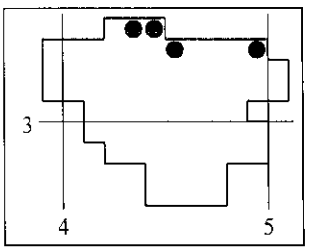


Common on the Forest (Hall 1980) and almost ubiquitous in our survey.

An extremely common plant of road banks, disturbed and waste places, and even locally frequent along the sides of paths among bracken and bramble on apparently quite poor soils. Also on alluvium in wooded areas but rarely growing to maturity and presumably washed in. As well as being common it is very easily found by botanists; its leaves become visible very early in the season and it continues to be easily identifiable until the autumn. It may therefore be that it really is absent from the two missing squares on our map.

Abundant throughout the British Isles and found over the whole of Europe except the far north, and in northern and western Asia.

Cruciata laevipes (Galium cruciata). **Crosswort.**



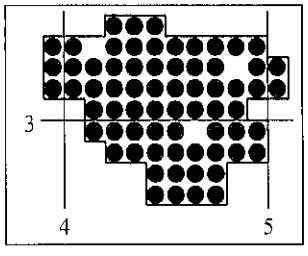
Six tetrads around the edges of the Forest (Hall 1980).

We have recorded it from very few sites: small stretch of riverbank on the Medway near Forest Row which straddles two squares (440.349), and on adjacent drive to Emerson College (438.348), 1995, TR & PA; verge of lane, Coleman's Hatch (457.337), 1995, PW; Five Hundred Acre Wood (491.331), 1987, PW & RW, not seen recently. Its rarity is quite surprising given the amount of 'edge' around the Forest, but is perhaps related to whatever factor determines the puzzling distribution in Sussex as a whole as referred to by Hall (1980).

Widespread in most of England, East Wales and southern Scotland but with some strange gaps. Its fine-scale distribution in the south-east indicates that it tends to avoid the usually drier, more open sites where *Galium verum* occurs, and they tends to be mutually exclusive plants (FR, pers. comm. 1996). It occurs in most of Europe north to the Netherlands and Germany, and in western Asia.

CAPRIFOLIACEAE

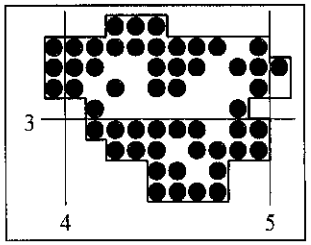
Sambucus nigra. **Elder, Eller, Ellet.**



Common on the Forest and especially around the edges near habitation and farms, usually on nutrient-rich soils with *Urtica dioica* and *Galium aparine*. Spread by birds and badgers.

Recorded in 99% of the tetrads in Sussex (Hall 1980), and also very common throughout Britain except in the Scottish mountains. It is widespread in Europe but has been widely cultivated for its fruits and the native range is difficult to establish. Also in western Asia and North Africa.

Viburnum opulus. **Guelder-rose, Stink-tree.**



Common on the Forest (Hall 1980).

Widespread mainly around the edges of the Forest, often on the more mineral-rich clayey soils. It tends to occur as scattered bushes along hedges and ditch sides, in damp scrubby woodland, and occasionally on the wet alluvial soils in the valleys.

The leaves have inter-floral nectaries at their base which are a common feature of leaves of tropical plants to attract ants; none have been seen on our plants!

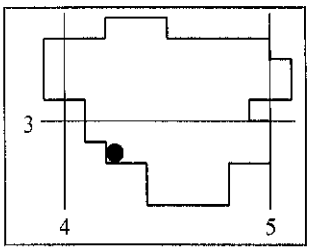
It is widespread in England and rarer in Scotland, and in Europe, except the south and Asia.

****Viburnum lantana.*** **Wayfaring-tree.**

Poundfield, Crowborough, E. D. Morgan (Wolley-Dod 1937).

Not refound. In Sussex this is a typical plant of chalk scrub, and there are occasional records from the Weald usually on railway banks (Hall 1980). It is widespread on calcareous soils in lowland southern England, in central and southern Europe and in Asia and North Africa.

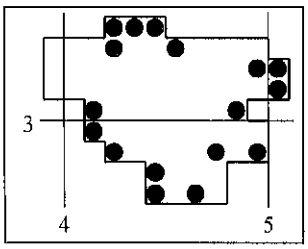
****Viburnum rhytidiaphyllum.*** **Wrinkled viburnum.**



One plant, Chelwood Corner (426.288), probably planted, 1994, PH/SBRS.

It is widely planted in Britain and originated in China.

****Symphoricarpos albus (S. rivularis).*** **Snowberry.**

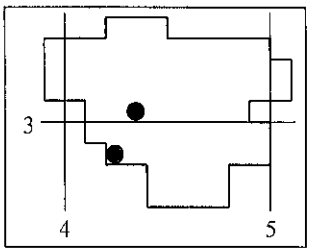


Four tetrads around the Forest (Hall 1980).

Small patches are established on road verges, wood edges, stream sides and outside gardens around the Forest. It was first introduced to Britain in 1817 and has been widely planted for game cover and ornament. It is now widespread in Britain and still increasing (Rich & Woodruff 1996).

It is native in North America, where it occurs from the lowlands to sub-montane habitats, on a wide range of soil types. It is usually found in forest edge vegetation which matches its pattern in Britain. Seeds require hot summers and cold winters before they will germinate and reproduction from seed seems to be a rare event in Britain, most of the spread being vegetative. The white berries are not attractive to birds and often rot on the plants (Gilbert 1995).

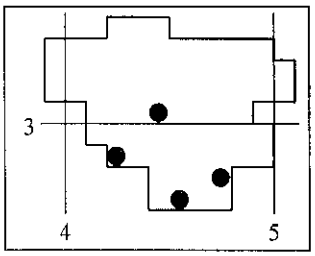
****Symphoricarpos × chenaultii.*** **Pink snowberry.**



Chelwood Corner (426.288), 1994, PH det. A. C. Leslie; entrance to Trees car park (433.306, and missed by TR on three occasions), 1995, PW.

This hybrid is possibly more widespread than we have realised - it has leaves hairy on the midrib underneath and pink berries. It originated in cultivation in Holland and was first introduced to Britain in 1955 (Gilbert 1995).

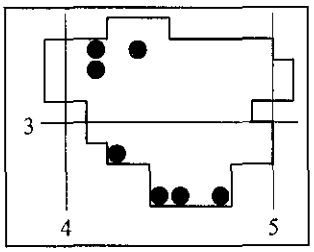
****Leycesteria formosa.*** **Himalayan honeysuckle.**



One plant, Chelwood Corner (427.287), 1994, TR; seedlings, Pippingford Park (44.30), 1993, SBRS; planted and self-sown on lane north of Forest Lodge (452.263), 1995, TR; two large bushes on back drive to Oldlands Hall (474.274), 1995, TR *et al.*

Only recorded from near Battle in East Sussex (Hall 1980), but becoming more widespread in England (Rich & Woodruff 1996). Native in the Himalaya and China.

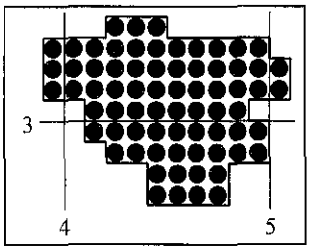
Lonicera nitida. **Wilson's honeysuckle.**



Probably mainly planted and relict from cultivation but some plants also appear to be self-sown. It is usually found near habitation.

Widely recorded in Britain and increasing in England (Rich & Woodruff 1996). Native in China.

Lonicera periclymenum. **Honeysuckle.**

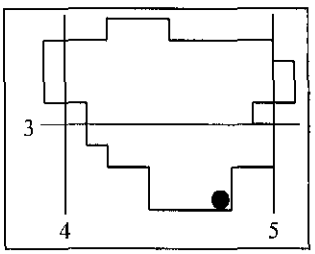


Recorded in every square in the Forest in old and secondary woodland and hedges, more rarely on verges or scrambling up through brambles, and most common on moist, acidic soils. It has been observed climbing up trees to at least 8 metres high, and it probably grows higher in some woodlands. The honeysuckle smell in the evening is a delight. In August the fruits go a bright, translucent red, sometimes contrasting with the cream flowers on nearby inflorescences. During the 1995 drought, many honeysuckles in woodlands were observed to have wilted, but fewer had done so in hedges.

Common, in 95% of the tetrads in Sussex (Hall 1980). Widespread in Britain, and in western, central and southern Europe, and Morocco.

ADOXACEAE

Adoxa moschatellina. **Moschatel.**



Tetrads 42T and 53B (Hall 1980), the latter probably from outside our area.

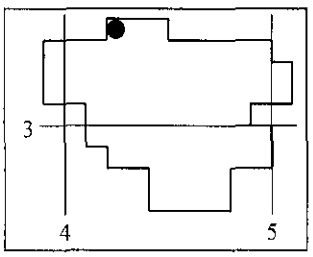
One patch c. 3 x 2 metres on roadside by an old hedge near Fairwarp Farm (473.266), pH 6.4, 1994, Chris Weaver; one patch c. 5 x 5 metres nearby in secondary woodland by track (472.265), 1994, TR & SR; several more patches scattered along lane (474.266, 474.267, 476.269), 1995, TR & PA.

This plant is usually regarded as an ancient woodland indicator species elsewhere, but the first two records are from Forest land in what is clearly secondary woodland.

It is locally distributed in Sussex and Britain in damp, shady, base-rich places in moist loams, on chalk, on alluvial soils by rivers, etc. Widespread in Europe though confined to mountains in the south. Asia and North America.

VALERIANACEAE

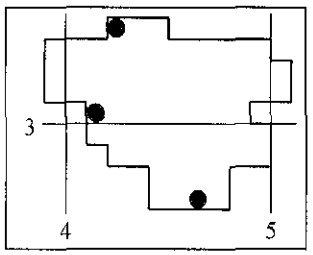
****Valerianella locusta.*** **Corn salad, Lambs lettuce.**



Hedge opposite Ink Pen Lane, Highgate (426.343), 1986, PS, and still present in abundance in 1995, TR (soil pH 7.6). It may be a relict from cultivation.

This species is scattered in Sussex in arable land, on old walls and near the sea. It is widespread but scattered in lowland Britain but is decreasing (Rich & Woodruff 1996). It is widespread in Europe though rare in the north. North Africa and western Asia.

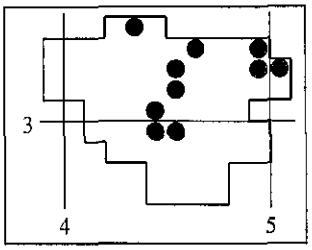
****Valerianella carinata.*** **Keel-fruited corn-salad.**



Two sites around Tompset's Bank (424.346 and 425.346), c. 1985, PS but not searched for again and likely still to be present; Fairwarp churchyard (466.267), PD (Briggs 1990), and still present in flower beds and on graves in 1995; several plants in the flower beds of the Red Lion Pub car park, Chelwood Gate (414.303), 1995, AK, right beside where we had parked for a Flora meeting the previous week and not noticed it!

Increasing but still rare in Sussex, often in churchyards and sometimes gardens. Increasing or perhaps increasingly recorded in England (Rich & Woodruff 1996), but still an uncommon plant. Southern, western and central Europe and North Africa; in central Europe it is a native of warm, rocky slopes where it is declining, but it is increasing as a neophyte in parks, gardens, etc.

Valeriana officinalis s.l. **Common valerian.**

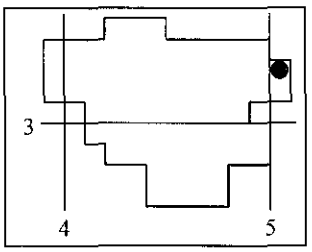


Five tetrads on the Forest edges (Hall 1980).

Confined to moist, sandy riverbanks, possibly just out of the reach of grazing animals, mainly along Millbrook through Pippingford to Marsh Green, along the stream in the Marden's Hill - Friar's Gate area, and also just outside the Flora area in Furnace Wood where it may have been recorded for the *Sussex Plant Atlas*. These stream sides are its typical habitat in the Weald, and our plants are probably subsp. *sambucifolia* but they have not been investigated in detail. They also occur in more open habitats in western England where the climate is damper. Plants which may be referable to subsp. *collina* occur in well-drained chalky woodlands or north-facing grasslands in Sussex. The name *V. officinalis* has not yet been typified but is usually applied to diploids which do not occur in Britain.

A variable species widespread in Britain, Europe and temperate Asia.

Valeriana dioica. **Marsh valerian.**

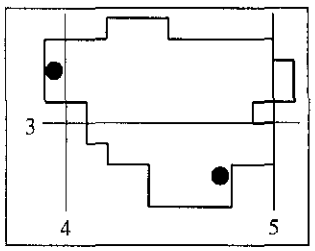


On the bogs on Ashdown Forest (Forster 1816). Crowborough Warren, E. H. Farr (Wolley-Dod 1937). Tetrad 43L (Hall 1980).

Surprisingly rare, and only one population of c. 20 plants was found in a shaded, wet flush in Home Wood (502.325), 1995, TR *et al.* As it has not flowered we do not know whether both sexes are present.

In Sussex it occurs scattered on heaths and boggy woodlands, and may be declining due to drainage. It is widespread but decreasing in England, northwards to southern Scotland (Rich & Woodruff 1996). Western and central Europe.

****Centranthus ruber.*** **Red valerian.**



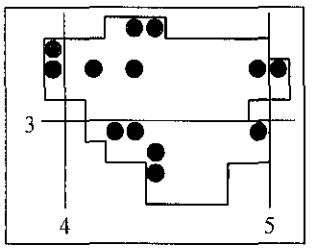
Walls at Plawhatch Hall (39.32), 1995, TR; walls at Oldlands Hall (475.277), 1995, PD *et al.*

An introduction often grown in gardens and naturalized on calcareous mortar on walls.

Locally frequent near the coast on chalky soils, walls, etc. in Sussex and southern Britain. Native in the Mediterranean and western Asia.

DIPSACACEAE

Dipsacus fullonum. **Wild teasel.**

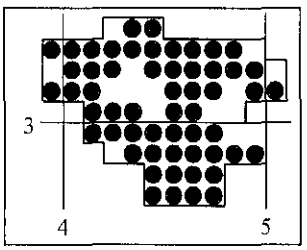


Tetrad 42N (Hall 1980).

Scattered around the Forest, often near habitation, and sometimes introduced with soil. It is common on the more calcareous soils and clays, and along riverbanks.

Widespread in Sussex but avoiding the acidic soils. Common and widespread in the lowland south-east of Britain, increasing in England (Rich & Woodruff 1996), rarer in the north and west. South, west and central Europe, western Asia and North Africa.

Succisa pratensis. **Devil's-bit scabious, Blue ball, Blue kiss.**



Common on the Forest (Hall 1980).

Scattered on the Forest in wet marshy areas, sometimes locally abundant, and often persistent on wet woodland rides in quite shaded conditions.

This is a species which occurs both on wet marshy acidic soils and on deeper, partly leached soils over chalk and limestone. It is quite widespread in Sussex and Britain, but is decreasing in England (Rich & Woodruff 1996). It is widespread in Europe except the extreme north and south, and in North Africa.

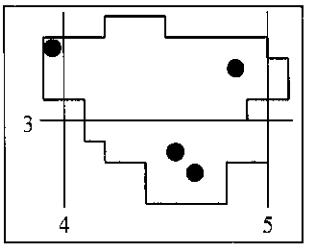
Knautia arvensis. **Field scabious.**

Tetrads 42U and 43M (Hall 1980). Not refound. This species tends to occur on calcareous soils and clays, and is common on the chalk in Sussex, with a few scattered records from the Weald. It is decreasing in England (Rich & Woodruff 1996). Widespread in Europe, western Asia and North Africa.

Carlina vulgaris. **Carline thistle.**
On Ashdown Forest, in the Warren east of the Quarry above Kidbrook (Coleman 1836). Forster (1816) also described it as common on Tunbridge Wells Common.

Probably extinct. It now appears to have gone from most sites on heathland and only remains on the chalk in Sussex. It is widespread but not common on calcareous soils in Britain and is decreasing in England (Rich & Woodruff 1996). Widespread in Europe and Asia Minor.

Arctium lappa. **Greater burdock.**



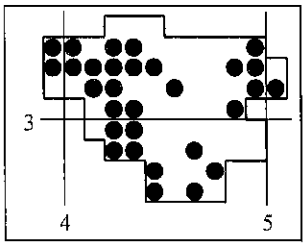
Tetrads 43M and 43R (Hall 1980).

Legsheath (39.33), 1994, AK; verge near Friend's car park (456.288), 1993, PW; Duddleswell (46.27), 1993, MM; Fagot Stack Corner (48.32), 1993, TR.

The fruiting heads of this species and *A. minus* have strongly hooked barbs which are readily caught in clothing or fur, and consequently plants are often found along paths and tracks. The bristles from the pappus fall from the heads and irritate the skin; the seeds are dispersed when the heads are pulled or scratched off.

Occasional on roadsides and riverbanks in Sussex, and mainly in south-east England. Probably under-recorded nationally. Widespread in Europe and Asia Minor.

Arctium minus. **Lesser burdock.**



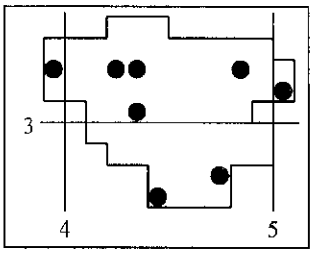
Frequent on the Forest (Hall 1980).

Plants are quite frequent over the Forest on the edges of car parks, by tracks and on waste ground, but often only a small proportion of the plants flower. Both subsp. *minus* and subsp. *nemorosum* were recorded on the Forest, and are mapped separately; subsp. *minus* is the commoner of the two, as also found in Hall (1980) although he was not over-confident of the records.

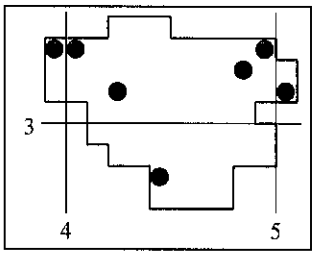
The status of *A. minus* subsp. *pubens* in Sussex remains to be resolved but it should occur in the Weald. It was mapped jointly with subsp. *nemorosum* in Hall (1980) and no further work has been carried out since. It has been mapped carefully in Kent by Philp (1982), and is locally distributed. In Surrey there are reservations about the taxonomy of the group (Leslie 1987). Any plants with long peduncles and lacking purple colouring would be worth looking at for subsp. *pubens*; these have only been found on waste ground at Wych Cross (419.320), 1995, TR.

Widespread and increasing in England (Rich & Woodruff 1996). Widespread in Europe, and North Africa.

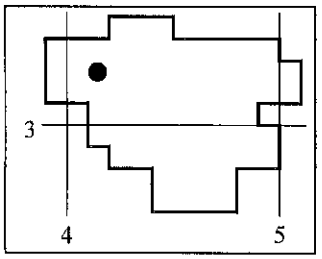
subsp. *minus*



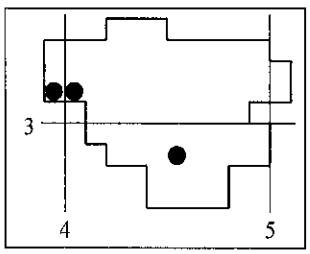
subsp. *nemorosum*



subsp. *pubens*



Carduus crispus (C. acanthoides). **Welted thistle.**

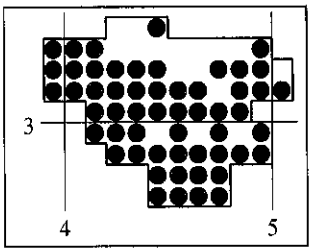


Twyford area (39.31) and Smockfarthing (40.31), 1994, DB; Near Stonehill car park (45.28), 1993, Flora meeting.

In Sussex most common on the chalk but also scattered in the Weald. Feldman & Lewis (1990) found that the wind-born seeds were rarely dispersed far from the parent plants, and although large quantities were produced many were predated. As 90% of the seeds germinate within a year there is little seed bank; persistence is mainly from local populations, and the Weald populations are therefore likely to be self-maintaining rather than relying on immigration from the chalk.

Widespread in lowland Britain. Widespread in Europe except the north and south-west.

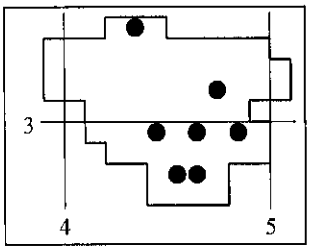
Cirsium vulgare. **Spear thistle.**



We have recorded it frequently but it is not common, and some 1-km records are of a single plant only. It occurs mainly as a weed of waste ground and pastures on south-facing slopes on the richer areas of soil on the south side of the Forest, and is largely absent from the wooded northern slopes and heathlands.

Recorded in 95% of the tetrads in Sussex (Hall 1980). Widespread in Britain. Europe, western Asia and North Africa, introduced elsewhere.

Cirsium dissectum. **Meadow thistle.**



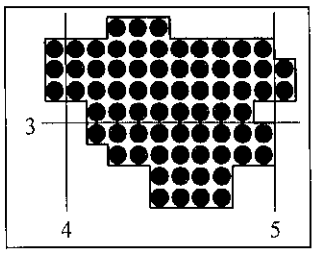
"Bog in Pappingford Warren, Ashdown Forest, in the corner next Gills Lap" (Coleman 1836). Frequent in bogs south of Forest Row, 1948, and near Nutley, 1957, R. A. Boniface. Eight tetrad records mainly on the south side of the Forest (Hall 1980).

We have fewer records and it is probably declining: north of Londonderry Farm (445.296), 1994, NM *et al.*; Airman's Grave (458.275), 1995, P. Maurice; Duddleswell (464.278), 1994, AK; near Hollies car park (461.278), 1992, AFRR; Old Lodge Bottom (465.299) with *Dactylorhiza incarnata,* 1993+, many recorders; north of Radio Station (479.295-482.293), 1992, AFRR; disturbed area of mown grass and bracken south-west of Wren's Warren (473.318), 1995, Flora meeting. Two sites have gone in recent years (not mapped): south of Royal Ashdown club house (431.341), 1988, PS, destroyed by drainage of bog on practice hole. Two AFRR records have not been refound; bog north of Goat car park, and north of Poundgate car park (482.286), 1983.

The young leaves of *Cirsium palustre* may be unlobed and are easily confused with *C. dissectum*; *C. dissectum* leaves are usually densely white-hairy underneath but this is not always the case with new growth.

In Sussex it mainly occurs on the Tunbridge Wells Sands and is very locally distributed. Widespread in flushes, bogs and wet meadows but not common in southern Britain and decreasing in England (Rich & Woodruff 1996). The great Irish botanist David Webb was once heard to remark how uncommon it was around the Irish Sea, and wondered if it had had a bad crossing? Endemic to western Europe with a southern-oceanic distribution, mostly near the coast in France.

Cirsium palustre. **Marsh thistle.**

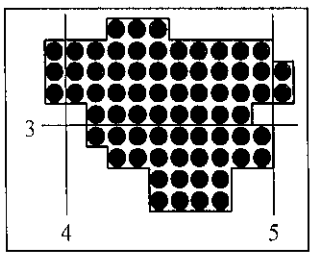


Ubiquitous on the Forest (Hall 1980), and we have recorded it in every square.

Frequent in rather boggy and sad corners of the Forest, and abundant in wet meadows near Marsh Green where it is reportedly grazed by depressed donkeys. It also appears in damp woodland when it is coppiced or cleared, but may not flower in deep shade.

Common in the Weald in Sussex, and nearly ubiquitous in Britain. Widespread in Europe, western Asia and North Africa.

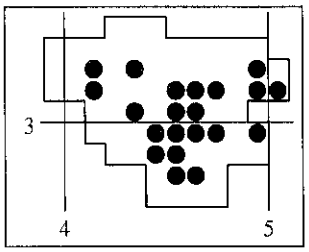
Cirsium arvense. **Creeping thistle.**



Recorded in every square in grassland, on verges and waste ground. It does not appear to be a significant weed on pastures locally, perhaps due to efficient control.

Ubiquitous, and one of the world's worst weeds. Patches can increase in size by over 6 metres a year, and are difficult to eradicate as the roots may grow to a depth of several metres. Abundant thistle-down can be seen floating on the wind in late summer but seed dispersal may be poor as the seeds are readily detached from the pappus.

Serratula tinctoria. **Saw-wort.**

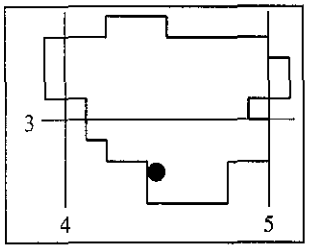


Ashdown Forest, near Maresfield, W. C. Unwin (Arnold 1887). Common on the Forest (Hall 1980).

Mainly concentrated in the southern parts of the Forest in open areas, where it occurs in two main habitats. It is locally abundant on road verges (e.g. Crowborough Road between Friends and Hollies car parks, pH 7.8, and near the bus shelter at Duddleswell, pH 6.3, Plate 3). It also occurs at low frequency but quite characteristically in damp heathland, often with *Gentiana pneumonanthe*, but sometimes simply with *Molinia* on the sides of gullies, an unexpected location. The populations have mixed female and hermaphrodite plants, the latter having broader flowering heads.

Mainly in the High Weald in Sussex and rare elsehwere (extremely rare in the Kent High Weald), and locally abundant in southern Britain. Widespread in Europe, except the north and south, and in Algeria.

Centaurea montana. **Perennial cornflower.**



Recorded once as an established garden escape at Nutley (476.276), 1995, TR.

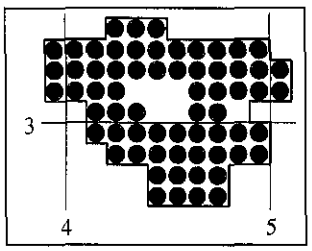
Occasionally recorded as a garden escape and increasing in England (Rich & Woodruff 1996). Endemic to the European mountains and widely cultivated.

Centaurea cyanus. **Cornflower.**

Probably extinct, Heron's Ghyll, E. D. Morgan (Wolley-Dod 1937). Sixty years ago Wolley-Dod had already noted that cornflower was "becoming rare and probably seldom found in its named stations" so its absence from the Forest is unsurprising and matches the situation across the whole country where it is now found only very sporadically. It is an arable weed and has probably declined due to cleaner seeds and herbicides (Rich & Woodruff 1996).

Native in south-east Europe and the Near East.

Centaurea nigra. **Common knapweed, Buttonweed.**

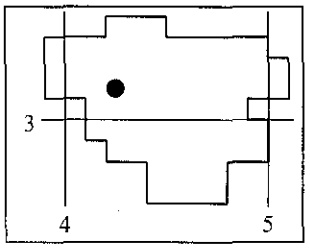


Widespread on road verges and in unimproved grassland, but rarely abundant (one exception being a pasture at Rystwood Road, 438.343). Absent from the heathy areas.

It is a very variable species in Britain, but our plants are fairly uniform.

Ubiquitous in Sussex (Hall 1980) and in Britain, so surprisingly endemic to Europe. It has been introduced to North America and Australasia where it is a serious weed.

Cichorium intybus. **Chicory.**



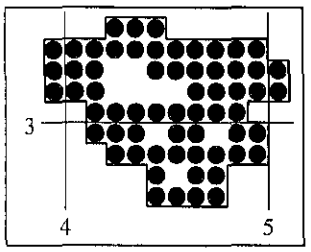
Tetrads 33W, 42Z, 43A and 43V (Hall 1980).

One site on A22 verge at the entrance to the Ashdown Forest Farm Park, Wych Cross (423.313), 1994, B. Radcliffe & J. Stoddart; two plants were present in 1995, TR. This does not correspond to any of Hall's tetrads, which have not been refound. The plants are conspicuous when the flowers open in sunshine but they close in mid afternoon.

Scattered in Sussex and lowland England where it is possibly native in East Anglia, and decreasing (Rich & Woodruff 1996). Widespread in Europe, western Asia and North Africa.

C. intybus is grown as a coffee additive or substitute, and for fodder in France. The cultivated salad chicory or endive is *C. endivia*.

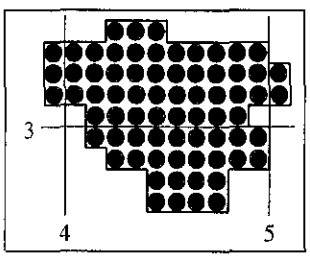
Lapsana communis. **Nipplewort.**



Widespread on verges, by hedges, on disturbed soil and in the villages, but rare in wooded areas and absent from the heaths. It is a winter- or summer-annual which tends to occur in open, nutrient-rich places or in light to moderate shade on soils above pH 5 (Grime *et al.* 1988).

Recorded in 99% of the Sussex tetrads (Hall 1980). Widespread in Europe, Asia and North Africa.

Hypochaeris radicata. **Cat's-ear.**



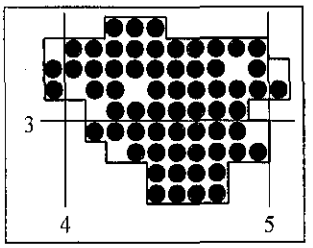
Recorded in every square, where it occurs on rides, banks, in acidic grassland and sometimes in permanent pasture.

This plant flowers continuously through the summer, though there are peaks in early June and September. About one hour of bright sunlight is needed to open the flowering heads and once open, they cannot close for a period of at least three hours, so if it rains the pollen for a whole day may be washed off. If it is warm and sunny the heads close after about 3-4 hours, but they will stay open for 6-7 hours in cooler, cloudy conditions (Turkington & Aarssen 1983).

We suspect that *Leontodon hispidus* has been over-recorded for this species; *Hypochaeris* can be easily distinguished in that it has simple not forked hairs on the leaves, and has pale yellow, triangular scales on the receptacle - this can be seen by plucking the florets out to leave the scales behind.

Recorded in 92% of the Sussex tetrads (Hall 1980). Widely distributed throughout Britain, mainly on neutral to moderately acidic, well-drained soils in grazed or mown pastures and on verges. Widespread in Europe, northern Asia and North Africa.

***Leontodon autumnalis* subsp. *autumnalis*. Autumn hawkbit.**



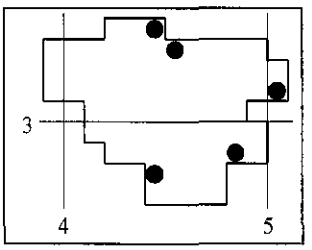
Common on the Forest (Hall 1980).

Widespread and locally frequent on road verges, pastures, rides and waste places on wet or acidic soils. It flowers in late summer and is a very variable species, some plants having almost entire leaves and others almost pinnate.

It is easily distinguished from the other *Leontodon* species by the branched flowering stems and has only simple hairs on the leaves. It is separated from *Hypochaeris* by the absence of receptacular scales.

Very common in Sussex and Britain. Widespread in Europe though rarer in the south. In Asia, North-west Africa and Greenland.

***Leontodon hispidus*. Rough hawkbit.**



Recorded in ten tetrads in Hall (1980), but surely over-recorded, perhaps for *Hypochaeris*?

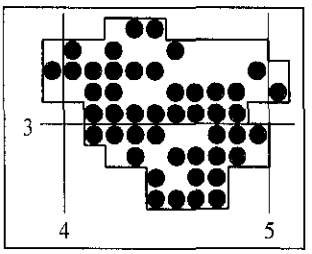
Poundgate road verge where chalk may have been used to build the road (484.285), pH 7.7, 1993+, Flora meeting; Rystwood Road on clay (441.344), pH 6.6, 1995, TR; Nutley churchyard, pH 6.6, Coleman's Hatch churchyard, pH 6.5, and St John's churchyard, pH 6.8, 1995, PD.

The rarity with which we have found this species compared to the apparent frequency in the *Sussex Plant Atlas* is surprising, and only two of the tetrads are in common. It is most abundant on chalk and limestone soils of mid to high pH, and would not be expected to be common on the Forest except in places with raised pH such as road verges as our measurements indicate. It is also characteristic of the churchyards; raised pH in soils around churches may be a result of calcium leaching from mortar either directly from the buildings or from discarded material when they are rebuilt, or perhaps from the tombstones. *L. hispidus* could have been present around Coleman's Hatch, where the soils are base-rich clay, and at Nutley, but must have been introduced elsewhere.

It is similar to *L. saxatilis* in having forked hairs on the leaves, a single stem and drooping buds, but all the achenes have a pappus, and the involucre is darker in colour and it is much more hairy (though *L. saxatilis* can sometimes be very hairy too). Hybrids between the two have been recorded in Britain but we have not found any.

Widespread in lowland Britain on calcareous soils and clays in unimproved pastures. Widespread in Europe and Asia Minor.

***Leontodon saxatilis (L. taraxacoides)*. Lesser hawkbit.**



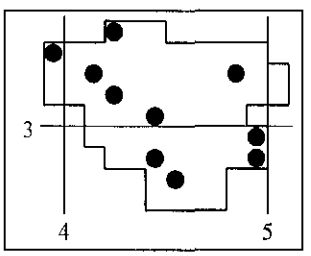
Locally frequent on the east side of the Forest (Hall 1980).

Although it is common on the Forest on road verges, tracks, lawns and open, dry grassland it is very often overlooked as an intensive search in East Sussex by PD proved, resulting in a large increase in records (Briggs 1990).

It is easily identified when in flower by the outer achenes which have no pappus, whilst the inner ones do. These outer fruits persist long after the inner ones have been blown away and the stem is dead (even as late as November).

Widespread in Sussex on heaths, on bare, open, generally acidic or sandy soils. Ubiquitous in Britain. Widespread in southern, central and western Europe.

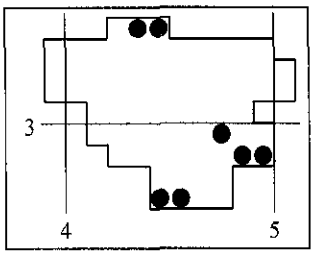
***Picris echioides*. Bristly oxtongue.**



Scattered around the Forest on dumped soil, road verges and in car parks, but usually only a few plants at a time, and not recorded in Hall (1980).

Common on the chalk and on clays, especially on roadsides and near the coast in Sussex. Locally abundant in south-eastern Britain and widespread in southern Europe and South-west Asia.

***Tragopogon pratensis* subsp. *minor*. Goat's-beard, Jack-by-the-hedge, Jack-go-to-bed-at-noon, Joseph's flower.**

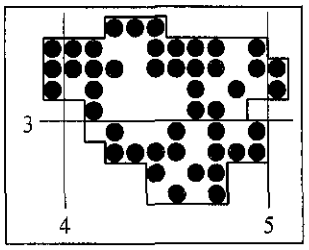


Frequent on the Forest (Hall 1980).

Very locally distributed around the Forest and mainly in the villages on waste ground and in rank grassland, a preferred habitat. It flowers in mid to late summer and was much more conspicuous in 1995 when the verges were left unmown.

Widespread in Sussex, especially on calcareous soils. Locally common in Britain northwards to eastern Scotland. Widespread in Europe and west and central Asia, with subsp. *minor* in west and central Europe.

***Sonchus arvensis*. Perennial sow-thistle.**

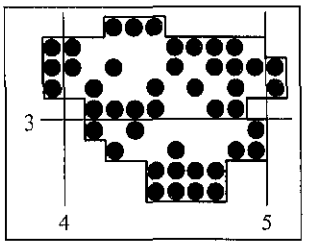


Common on the Forest (Hall 1980).

A perennial species mainly associated with verges where it is often mown short and does not flower. It is easily identified by the yellow-orange hairs on the involucre.

Recorded in 90% of the Sussex tetrads (Hall 1980). Widespread in Britain, Europe and western Asia.

***Sonchus oleraceus*. Common sow-thistle.**

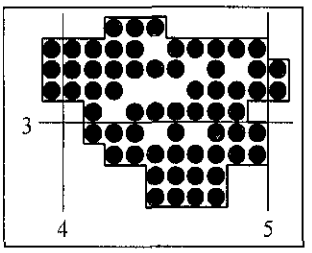


Common on the Forest (Hall 1980).

An annual, widely scattered on waste ground, disturbed soil, road verges and in the villages. It is probably less common than *S. asper* but occurs in similar places.

Recorded in 90% of the Sussex tetrads (Hall 1980). Widespread in Britain and Europe, Asia and North Africa.

***Sonchus asper*. Prickly sow-thistle.**

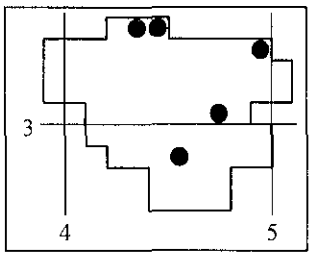


Common on the Forest (Hall 1980).

Widely scattered on disturbed ground, road verges and in the villages. It has shiny, very spiny foliage with rounded auricles, whilst *S. oleraceus* has more glaucous, sparsely spiny foliage with pointed auricles.

Recorded in 90% of the Sussex tetrads (Hall 1980). Increasing in England (Rich & Woodruff 1996), and widespread in Britain, Europe, Asia and North Africa.

****Lactuca serriola*. Prickly lettuce.**

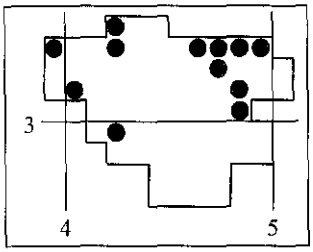


Forest Row (437.347) and Lines Farm (445.347), 1995, TR; Crowborough Road (45.28), 1993, Flora meeting; one young plant in ditch beside road north of King's Standing (471.304), 1995, TR & PW; Friar's Gate area (49.33), 1994, RN & ER.

This species behaves as a ruderal in Britain and is commonly found where earth has been moved such as on roadsides or industrial estates, but it also occurs in more natural habitats such as shingle banks. It will not grow on water-logged soil or on acidic peat, and is equally rare on skeletal calcareous soils (Prince & Carter 1977). The flowering-heads open in the morning and close in the afternoon.

It is increasing in England (Rich & Woodruff 1996), and all our records are supplementary to the *Sussex Plant Atlas* where it is mainly recorded from the coast. Widespread in southern Europe, Asia and North Africa.

***Mycelis muralis*. Wall lettuce.**



Seven tetrad records (Hall 1980).

Locally frequent in the north-east of the Forest on the damp, more calcareous soils in woodland, and scattered elsewhere on roadsides, stream sides, brickwork, etc. It is usually a marked calcicole of soils of pH 6 or above (Grime *et al.* 1988) and may be restricted by soil type in our area.

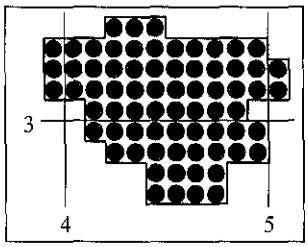
In Sussex locally frequent in the west and less common elsewhere. Locally abundant in areas of Britain with high rainfall, and widespread in Europe, Asia Minor and North Africa.

***Taraxacum*. Dandelions.**

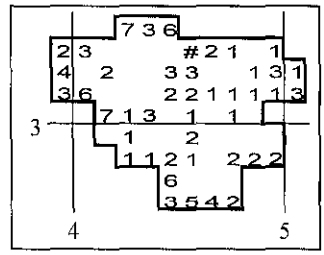
Dandelions are one of the major critical groups in Britain which require specialist knowledge for identification. Over 230 species have been recorded to date in Britain many of which are probably endemic. Their reputation is so fierce that they strike fear into the heart of the keenest botanist and only madmen try to identify them; we have therefore coined the phrase "madologist" to describe anyone studying *Taraxacum*.

Dandelions of the British Isles (Dudman & Richards 1995) is an excellent account of the genus which we have used as the basis for the identification and nomenclature. There are no previous records for the Ashdown Forest area for individual species, and East Sussex in general has been poorly worked (Hall 1980). A little help from an expert is essential to get started and it simply takes time to learn them - perhaps "this year, next year, sometime, never" as measured on the dandelion clock. Our records are based on the results of a survey by Jan Kirschner, the Czech expert, during Easter 1995. John Richards has kindly looked through the material we collected and corrected a few names; the material is now held in **herb. PH.** Not surprisingly our records for the critically determined taxa largely coincide with squares visited by Jan.

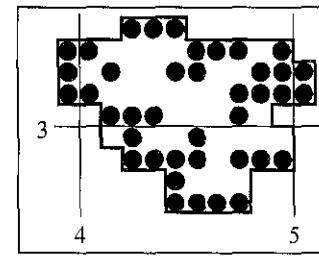
Taraxacum genus



Number of species determined (# = 11)



Squares recorded by Jan Kirschner



Dandelions initially all look the same and yet different to the untrained eye, but once they are known there are many slight differences which define the species. Most, if not all British species are agamospermous (producing by seeds without the usual sexual process). Even if insects are observed visiting the flowers, as brimstone butterflies do on the Forest in April, they are not cross-fertilising them.

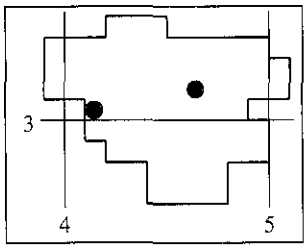
To make identification of the species more manageable, the genus is broken down into nine sections in Britain, four of which occur in our Flora area. It is not possible to identify every individual dandelion at the moment, and the technique employed is to look for species which are known, then collect and learn new species. Identification needs to be based on plants carefully selected in the field, which are then pressed for later reference. Plants should be collected soon after they come into flower for the first time, usually in mid-April, so that the outer leaves can be collected with a young flowering-head. Plants flowering in summer or growing in shaded, trampled or frequently mown places, or those with damaged, infested or diseased leaves should be ignored.

Dandelions have been recorded in every square on the Forest. We would expect at least 50 species from the Flora area, but to date have named about half that number. The distribution maps reflect first the areas that we recorded, and secondly the richer dandelion areas because experience rapidly indicated that the central areas of the Forest were very poor with few species.

The habitat determines which species are likely to be found. The main habitats for Sections *Hamata* and *Ruderalia* are hedgebanks, road verges, meadows and waste land in the villages, where they occur in disturbed, open vegetation on relatively nutrient-rich soils. Section *Celtica* species occur on nutrient-poor grasslands - these are likely to be the original native species of the area. Section *Erythrosperma* species occur in dry, open habitats. Dandelions are rarely found in heathland or in woodlands, and consequently Ashdown Forest does not have many species.

British dandelions are not representative of the genus as a whole. Elsewhere in Eurasia there are many diploid sexual species, and plants may have white, pinkish or reddish flowers, they can have more than one flowering-head on each scape, they may flower in the autumn, have leathery leaves or flower without any leaves visible at all. World-wide there are about 2000 species, with the greatest diversity in the mountains of central Asia.

Section *Erythrosperma.*

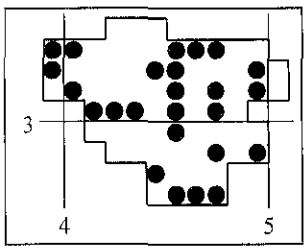


This section includes small plants with dissected leaves and reddish fruits which usually occur in dry, open grassland, on either calcareous or acidic soils. However, they appear to be surprisingly rare on the Forest. One fruiting plant, sandy ground, Isle of Thorns (418.303); car park at King's Standing (468.315), possibly lost when they closed one car park entrance, both 1995, TR, and both too far gone to identify to species. There is also a record for *T. "laevigatum"* which equates to Section *Erythrosperma* for tetrad 42T in Hall (1980) which has not been refound.

Section *Celtica.*

This group includes the main native species of the area. They typically occur on nutrient poor soils in lightly shaded places with moderate levels of disturbance. Most of the species within the group are quite distinct and are easily identified; they are by far the best group for a non-specialist to start with.

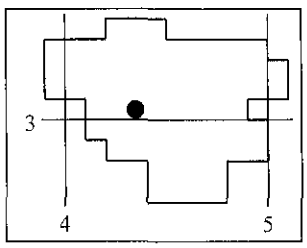
Taraxacum nordstedtii.



This distinctive little dandelion is one of the most widespread on the Forest verges, hedgebanks and meadows. It is a variable species but plants from Ashdown Forest are quite typical.

It is fairly common and widespread in Britain (the second most-recorded species), and in west and central Europe.

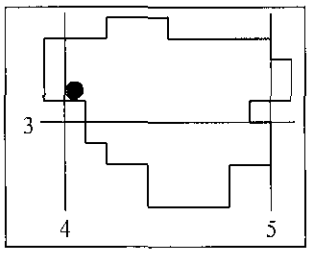
Taraxacum unguilobum.



This is a very distinctive little species, for which there was one site on grassland at the entrance to Chelwood Vachery (435.304), pH 6.1, 1995, JK & TR, the first record for East Sussex. This species has more than its fair share of good characters; it lacks pollen, has yellow stigmas and backward-pointing leaf lobes.

It typically occurs on sandy soils and is common in northern and western Britain, but may be introduced in the south-east. It also occurs rarely on the continent (e.g. sand dunes in Holland).

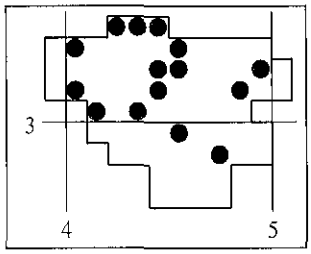
Taraxacum gelertii.



Only one site for this dandelion which has white-bordered, erect bracts, was found on verges north of Suttons Farm (403.314), pH 6.5, 1995, JK & TR.

This is one of the commonest species of Section *Celtica* in Britain. In Europe it reaches as far east as Poland and the Czech Republic.

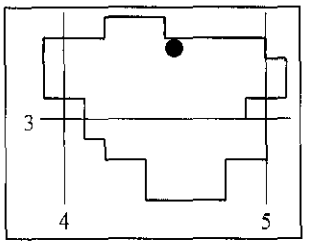
Taraxacum subbracteatum.



This is probably the second commonest member of the section in the Ashdown Forest area, and it occurs most characteristically on nutrient-poor verges around the Forest. It is quite distinct and easy to identify.

It occurs throughout Britain and is locally abundant.

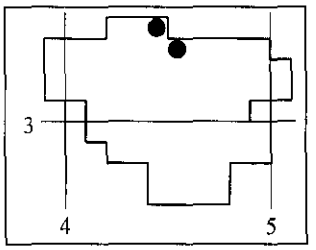
Taraxacum excellens.



Scattered along the hedgebanks near Hart's Farm (456.336-8), 1995, JK & TR.

It occurs scattered throughout Britain but is most frequent in the west.

Taraxacum bracteatum.



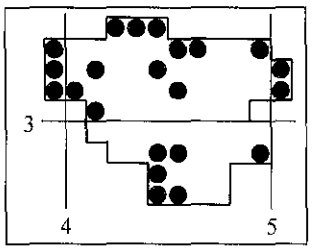
Recorded from a hedgebank near Hart's Farm (458.336) and from a verge in Parrock Lane (446.342), 1995, JK & TR, but possibly more common.

It is widespread in damp habitats throughout the British Isles.

Section *Hamata.*

This is the commonest dandelion section on the Forest, and is especially characteristic of road verges. The species of this section are very similar to each other and are difficult to distinguish. In most places on mown verges they have not developed properly and cannot be identified with any certainty.

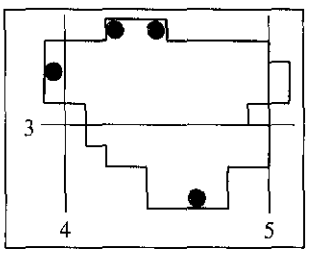
Taraxacum pseudohamatum.



This is the commonest dandelion in the Flora area and is usually the first species to come into flower in the spring. It is quite robust and has broad, outer involucral bracts.

It is very frequent on verges and one of the commonest species in Britain. It occurs commonly in western Europe.

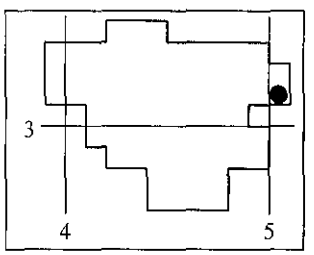
Taraxacum hamatiforme.



There are records for this species from Parrock Lane (449.346), the edge of the golf course at Forest Row (429.344), verges at Plaw Hatch Farm (393.324), and another possible one from the east end of Toll Lane (464.264), 1995, JK & TR.

It is widespread in Britain and one of the most common species of the section in Europe.

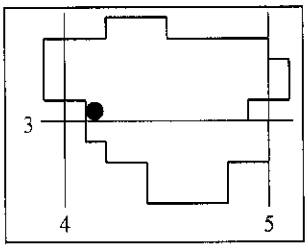
Taraxacum hamatum.



Recorded once at School Lane, St John's (505.318), 1995, JK & TR, but possibly more widespread on verges.

Widespread in Britain and Europe (the third most commonly recorded species in Britain, so oddly rare here), its eastern-most known locality is Moscow.

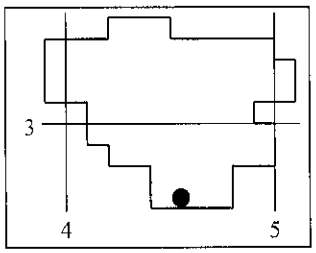
Taraxacum hamatulum.



Plant on a verge near Birch Grove House (413.305), 1995, JK & TR (det. A. J. Richards).

It is scattered in southern England and Wales, and may be introduced.

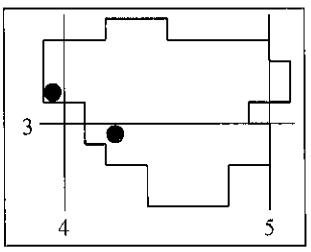
Taraxacum lancidens.



There was one record from a verge on sand at the west end of Cackle Street (450.266), 1995, JK & TR. This seems to be a new East Sussex record for this introduced species.

In Britain it has been previously recorded from Dorset and Cheshire. It is scattered in west and central Europe.

Taraxacum quadrans.



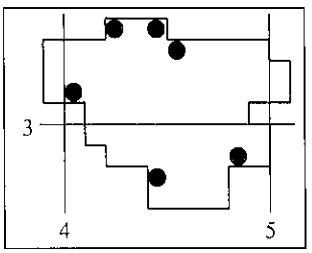
There are a few scattered records from roadsides on the Forest and adjacent areas; Chelwood Beacon (424.294), Nutley (444.269), Balcombe Farm (391.312), 1995, JK & TR.

It occurs scattered through Britain but may not be a native species. It is widespread in Europe, but probably not common.

Section *Ruderalia.*

This is the biggest section of *Taraxacum* in Britain, and the species can be very difficult to identify. They tend to be big robust species on nutrient-rich soils, and as the name suggests they occur as ruderal species in towns and villages - the best place to look for them is on the scruffy, unmown edges of unsurfaced lanes. Those found on the Forest area have probably all been introduced.

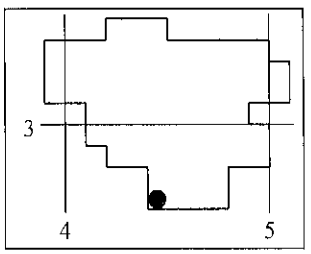
Taraxacum ekmanii.



Gilham Lane, Forest Row (424.349), A26 verge, Poundgate (487.287), grass verge, School Lane, Nutley (442.278), hedge bank near Harts Farm (458.336), Highgate Road, Forest Row (425.343), verge, Parrock Lane (446.344), verge immediately north of Suttons Farm (403.314), pH 6.5, all in tall grass on verges.

Common elsewhere in Britain and Europe.

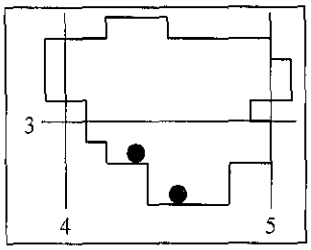
Taraxacum ancistrolobum.



Recorded once from Down Street at Nutley (444.269), 1995, JK & TR.

Widespread in Britain, where it is very common in the lowlands in the north. Scattered in west, central and northern Europe.

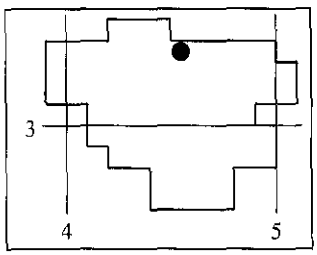
Taraxacum sinuatum.



Recorded from road verges between Nutley and Chelwood Gate (434.288), and at the west end of Cackle Street (450.266), 1995, JK & TR, the first records for East Sussex.

It is scattered in both the west of Britain and in Europe.

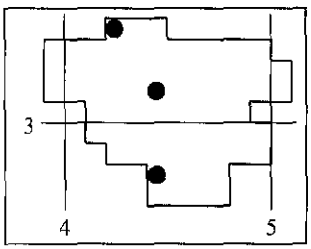
Taraxacum alatum.



One of the most widespread species in Europe, but only found once on Ashdown Forest near Hart's Farm (458.336), 1995, JK & TR, the first record for East Sussex!

It is widespread and locally common in Britain.

Taraxacum pulchrifolium.

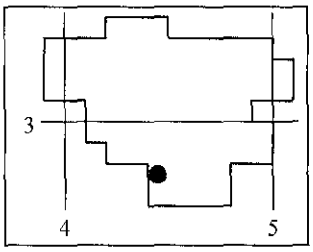


Recorded as one plant in Highgate Road, Forest Row (425.343), abundant as the dominant plant on the bank by the school in Nutley (442.278), pH 7.2, both 1995, JK & TR; one plant in Pippingford Park by Centre Bridge (449.317), 1995, TR.

It is an introduced species scattered in Britain, but is fairly common in continental Europe.

The name *pulchrifolium* means "beautiful-leaved", which it is.

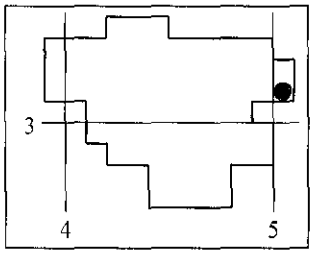
Taraxacum interveniens.



Recorded on the bank by the school in Nutley (442.278), pH 7.2, and near the Post Office (443.276), 1995, JK & TR. Its occurrence with *T. pulchrifolium* at the school in Nutley suggests that both species may have been introduced with foreign grass seed.

It is scattered throughout Britain, but very common in central Europe.

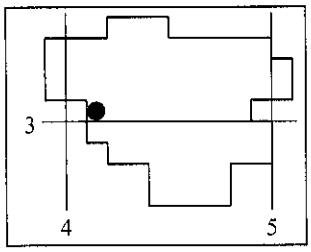
Taraxacum amplum.



A few plants on a bank on the east side of Old Lane, Crowborough (507.313), 1995, JK & TR, the first record for East Sussex.

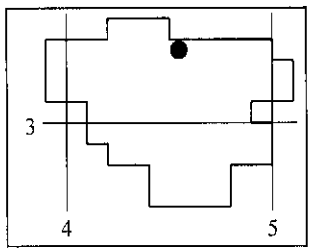
Very rarely recorded in Britain but fairly common on the continent.

Taraxacum corynodes.



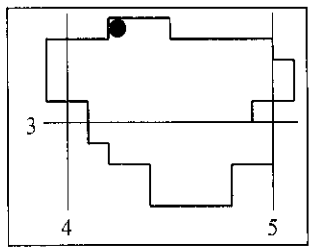
One plant on a verge near Birch Grove House (413.305), 1995, JK & TR, the first record for East Sussex. Introduced and scattered in Britain, mainly in the west. Scattered on the continent.

Taraxacum undulatum.



Recorded once on a hedgebank near Hart's Farm (456.338), 1995, JK & TR (det. A. J. Richards), the first record for East Sussex. Scattered through Britain and Ireland on waste ground, etc.

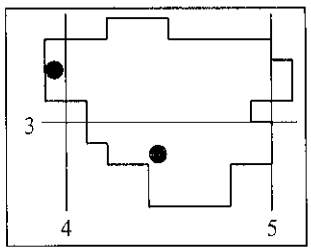
Taraxacum pallidipes.



Recorded once on a track side in Forest Row (424.349), 1995, TR & JK, the first record for East Sussex.

It is scattered on road verges in Britain but is probably under-recorded. It is not rare on the continent.

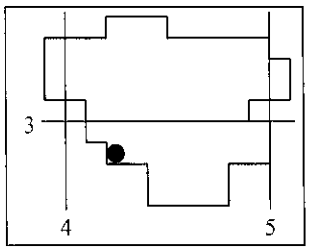
Taraxacum lacerifolium.



Recorded on verge opposite Woodside, Nutley (447.288), pH 8.1, and on verges at Plaw Hatch Farm (393.324), 1995, JK & TR, the first records for East Sussex (det. A. J. Richards).

It is locally frequent in southern Britain and is probably introduced.

Taraxacum ochrochlorum.



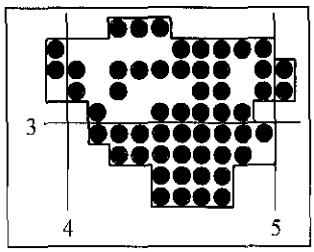
This species which has very broadly winged petioles and orangy flowers was recorded once from a verge at Chelwood Gate (426.288), 1995, TR & JK, the first record for East Sussex (det. A. J. Richards).

It is introduced to Britain and is scattered throughout but may be overlooked for *T. ekmanii*.

Taraxacum, unnamed species.

There is a common, widespread plant on verges all round the Forest which has been found in almost all localities visited. A provisional name has been given to the plants but as it is variable there may be more than one taxon involved, and some specimens are perhaps close to *T. multicolorans* and/or *T. obliquilobum*.

***Crepis capillaris*. Smooth hawk's-beard.**

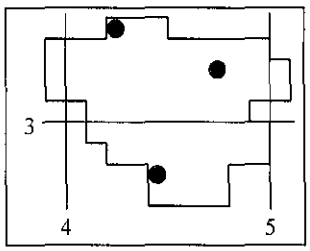


Common on the Forest (Hall 1980).

Locally frequent on disturbed soils, on verges, in car parks and pastures, and usually on dry open soils. It is very variable in size from tiny plants 5 cm tall in grassland grazed by rabbits to large ones over 30 cm high on verges.

Very common in Sussex and lowland Britain. Western, central and southern Europe.

****Crepis vesicaria*. Beaked hawk's-beard.**



Tetrads 42P, 42T and 42U (Hall 1980).

Highgate (42.34), 1993, TR; Nutley (44.27), 1995, TR; one good plant on disturbed ground used for car parking, Wren's Warren (472.324), 1995, PW; these do not relate to any of Hall's tetrads. It tends to flower in early summer and is best distinguished from robust forms of *C. capillaris* by the beak to the fruits as the English name indicates.

Locally frequent in Sussex near the coast, on the chalk and occasional elsewhere often in grass on road verges. First recorded in Britain in 1713, now locally frequent in south-east England and still spreading. Native in west, central and southern Europe.

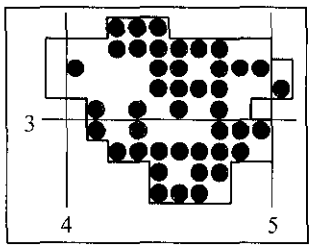
***Pilosella officinarum (Hieracium pilosella)*. Mouse-ear-hawkweed.**

Frequent on the Forest (Hall 1980).

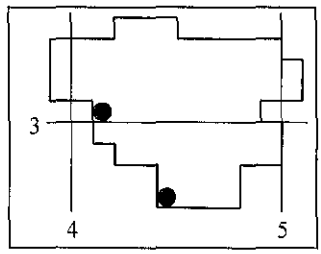
Locally frequent on dry, open soils on verges, lawns and banks, and in grassland. Subsp. *euronota*, subsp. *micradenia*, subsp. *officinarum*, subsp. *tricholepia* and subsp. *trichoscapa*, which differ in their hair types (see Rich & Rich 1988), have been recorded in 1993-1995 by TR. There are no data available on the occurrence of the subspecies in Sussex.

Widespread in Sussex and in Britain, but decreasing in England (Rich & Woodruff 1996).

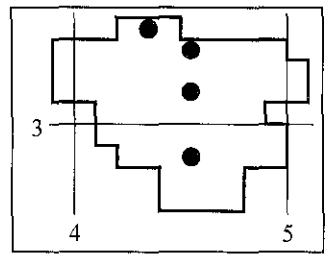
Pilosella officinarum



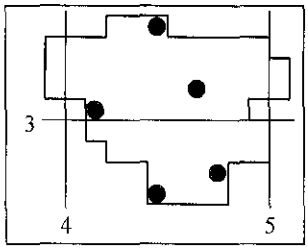
subsp. *euronota*



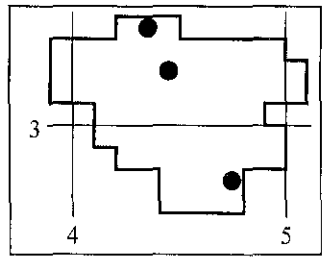
subsp. *micradenia*



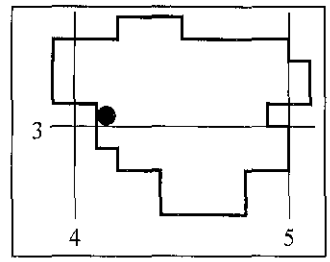
subsp. *officinarum*



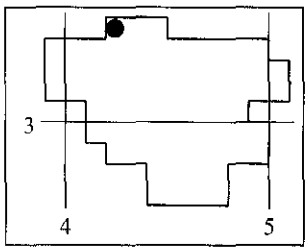
subsp. *tricholepia*



subsp. *trichoscapa*



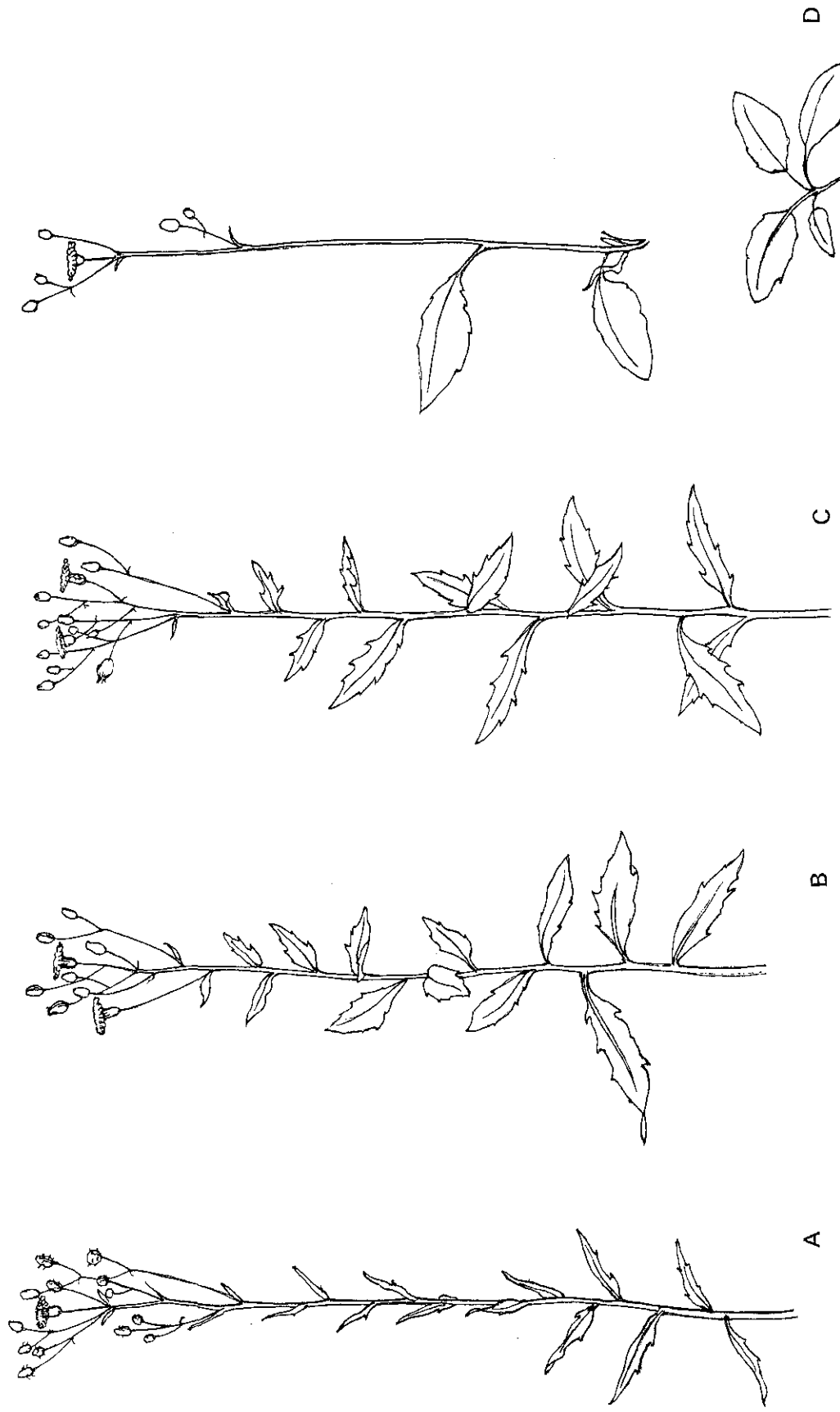
****Pilosella aurantiaca (Hieracium aurantiacum)*. Fox-and-cubs.**



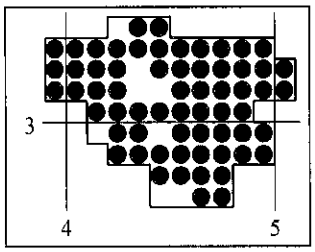
Forest Row (42.34), 1995, DB & PD, where it is locally established on lawns. The orange flowers only open in bright sunshine. The creeping shoots form patches and the grass around them is often suppressed, perhaps by allelopathic chemicals emitted from the plants.

Scattered in Sussex and lowland Britain, usually near habitation. Native in Europe.

Hieracium species on Ashdown Forest. A. *H. umbellatum*. B. *H. sabaudum*. C. *H. trichocaulon*. D. *H. exotericum* aggregate.



***Hieracium*. Hawkweeds.**

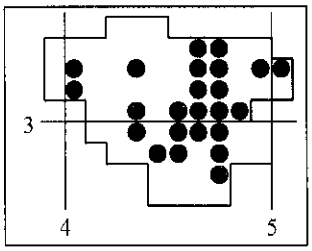


This genus is one of the most difficult in Britain, with no up-to-date monograph to aid identification. There are about 25 species in the Weald which could occur in the Flora area, but most are quite rare. Our plants have been named by comparing specimens against named material in the Natural History Museum (**BM**), and with help from Rod Stern who has also produced a key to south-east England hawkweeds (see BSBI *Hieracium* study group newsletters). We have recorded four species and *H. cantianum* could also be present.

There are very few records of *Hieracium* by F. J. Hanbury listed in Wolley-Dod (1937), despite the fact that he wrote a monograph on the genus in 1904 and lived at Brockhurst, East Grinstead; Wolley-Dod's plants were mainly named instead by H. W. Pugsley.

Hieracium nomenclature follows Sell (1968).

Hieracium umbellatum

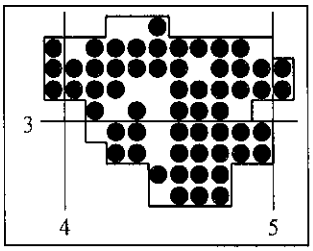


Ashdown Forest, 1841, J. Weaver (Wolley-Dod 1937). Var. *coronopifolium* was noted near Wych Cross on road to Nutley, C. H. Waddell (Wolley-Dod 1937) but it is no longer recognised. Recorded as locally frequent in Hall (1980) with Ashdown Forest as the major stronghold in East Sussex.

We have found it on verges, scrub margins and hedgebanks. This is the last species on the Forest to come into flower, and is immediately distinguished from the others by the erect phyllaries on the buds and many narrow leaves on the stem. It varies much in size of plant and flowers, and in leaf shape and size; our plants belong to the narrow-leaved typical group of the east of Britain and are subsp. *umbellatum*.

It occurs on heaths, grassy places and rocks throughout Britain (especially in the Weald).

Hieracium sabaudum (H. boreale, H. obliquum, H. perpropinquum).



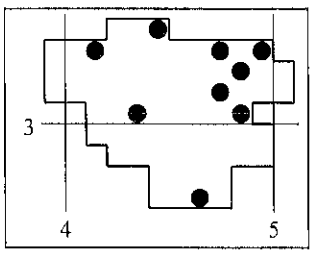
In a hedge near Forest Row, 1819, E. Forster; Ashdown Forest, J. Weaver; Nutley Road near Wych Cross, R. S. Standen (Wolley-Dod 1937). Common on the Forest (Hall 1980).

This is a variable species of open acidic woodland and heaths, on sandy soils.

Throughout England and Wales and especially the Weald, where it is one of the commonest species. It has many leaves on the stem which are very weakly toothed, and have long hairs.

(A BSBI Monitoring Scheme record for *H. strumosum* on Twyford Lane verge (404.315) may have been *H. sabaudum*.)

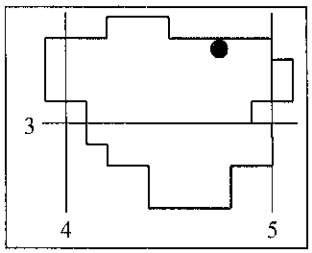
***Hieracium trichocaulon* (*H. tridentatum sensu* Pugsley).**



Near Wych Cross on road to Nutley, C. H. Waddell (Wolley-Dod 1937).

This is the second species to come into flower, and is scattered around the Forest, usually on track or road verges or maybe that is where we have seen it most often. We did not really understand it until 1995, and consequently it may have been under-recorded. It has many stem leaves which usually have three strong teeth, and many fewer hairs than *H. sabaudum*.

***Hieracium* species, included in the *H. exotericum* aggregate (*H. murorum* aggregate).**



Ashdown Forest, 1899, T. Hilton (**BTN**). Tetrads 33W and 43R (Hall 1980).

One site on the road bank opposite Pooh car park (472.331), 1995, TR (probably the 43R record in Hall 1980). This is the first species to come into flower in June, and consequently gets nobbled first by the verge cutters and later by ditch maintenance. It only has 0-1(-2) stem leaves and a marked basal rosette. Philp (1982) points out that the taxonomy of these plants is not yet sorted out, and we have not taken the matter further.

***Filago vulgaris*. Common cudweed.**

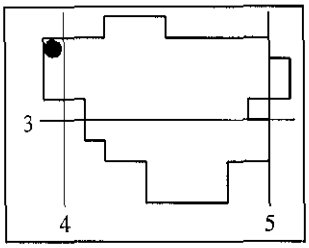
Presumed extinct. Tetrad 42N (Hall 1980)?

Not found in our survey. This plant is rather scarce in Sussex with only two reliable recent records from East Sussex. The map in Hall (1980) over-estimates its frequency as it is now known that in a number of cases it was recorded in error for *Gnaphalium uliginosum* (e.g. seven of the tetrad records in Hall are known to be incorrect; Briggs 1990) and the same is probably true of some others, so the tetrad 42N record may not be correct. The source of the confusion seems to have

been the use of English names by inexperienced recorders as both *F. vulgaris* and *G. uliginosum* have been called common cudweed.

Locally abundant in eastern England and rarer elsewhere. It is decreasing (Rich & Woodruff 1996). West, central and southern Europe, western Asia and North Africa.

***Filago minima*. Least cudweed.**



There are a few early records for *Filago minima* in the Ashdown Forest area: "On Ashdown Forest, about the Stone Quarry near Kidbrook" (Coleman 1836); Fairwarp, E. H. Farr; Ashdown Forest, Miss M. Cobbe (Wolley-Dod 1937) but it was not recorded in Hall (1980).

In 1993 AK found a small colony together with *Ornithopus* on a roadside near Goat cross-roads (397.332) from which the scrub had been recently cleared. In 1994 the site was becoming overgrown and the number of plants of *Filago* and *Ornithopus* had declined. By 1995 the site had become completely overgrown with gorse, birch and bramble, and neither species could be found. Given the conditions under which they originally appeared if the scrub were cleared again the plants would probably reappear.

Like all species of *Filago*, *F. minima* is declining nationally (Rich & Woodruff 1996). The British distribution shows a distinct preference for the east of the country but the Sussex distribution is concentrated in West Sussex where the sandy commons, pits and fields which are its preferred habitat are more common. It seems never to have been common in East Sussex and our site is the only one currently known in the vice-county. One reason for its scarcity on Ashdown Forest may be that the sand is more clayey and moister than the main West Sussex sites.

Widespread in Sussex, Britain and Europe, except in the north.

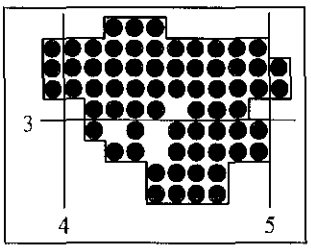
***Gnaphalium sylvaticum (Omalotheca sylvatica).* Wood cudweed.**

On Ashdown Forest, in pits by the road near Leg's Heath Gate (Coleman 1836). Crowborough, Miss M. Cobbe (Wolley-Dod 1937). Tetrad 42T (Hall 1980).

Presumed extinct. No plants were found during our survey and it seems that this plant has declined significantly since the 1960s and 1970s when the data for Hall was collected. Whereas Hall shows 27 tetrad records for East Sussex there are no recently confirmed records for the vice-county. The reason for its recent scarcity is unclear as its typical habitat of open areas and rides in woodland is still relatively common.

Nationally it is widespread but is believed to be declining (Farrell 1994; Rich & Woodruff 1996). Widespread in Europe, and a calcifuge. Also in North America.

***Gnaphalium uliginosum (Filaginella uliginosa).* Marsh cudweed (Common cudweed).**

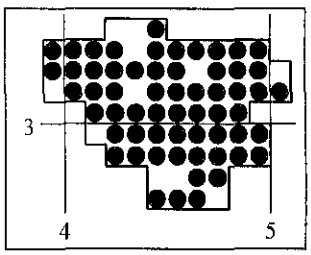


Common in damp, rather bare or disturbed places all over the Forest.

In Sussex it is common everywhere except on the chalk. It occurs over most of England and Wales but becomes increasingly scarce toward the north of Scotland. It is one of the commonest species on mud, and very variable in size in response to the growth conditions (Salisbury 1970).

Widespread in Britain. Europe, western Asia and North America.

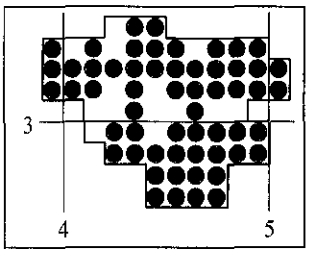
***Pulicaria dysenterica*. Common fleabane.**



Widespread on the Forest in damp grassland, road verges and on woodland rides especially on the clays, usually as small scattered patches but also sometimes in abundance as in meadows near Home Farm (444.304). Once the flowers open in July they are very attractive to insects, and they sometimes seem to shimmer with brimstones and meadow browns.

Recorded in 90% of the tetrads in Sussex (Hall 1980). Widespread in lowland Britain and locally common north to the Scottish border. West, central and southern Europe north to Denmark. Asia Minor and North Africa.

***Solidago virgaurea*. Goldenrod.**



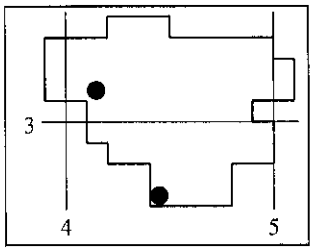
Common on the Forest (Hall 1980).

Locally frequent in open woodland, scrubby heathland and on road banks (Plate 3).

Frequent in the High Weald and on other acidic soils in Sussex.

Widespread on acidic soils, especially in western Britain and interestingly also on chalk downs and cliffs in east Kent (FR, pers. comm. 1996). Widespread in Europe, Asia and North America.

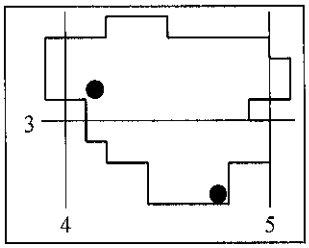
***Solidago gigantea.* Early goldenrod.**



Well established patches on A275 verge near Reservoir car park (419.315), 1993+, TR; south of Nutley (44.26), 1994, TR.

Scattered in Sussex and increasingly established in England (Rich & Woodruff 1996). Native in North America.

***Aster.* Michaelmas daisies.**



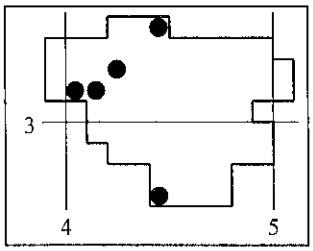
A number of species of *Aster* and their hybrids are cultivated in Britain, and many taxa are naturalized. None of our records have been critically determined but they are likely to be *A.* × *versicolor* or *A.* × *salignus*, the commonest taxa in Sussex.

Tetrad 42N (Hall 1980).

A275 verge near Reservoir car park (419.315), 1993+, TR, no doubt from plants dumped at the lay-by; garden throw-out, Fairwarp (474.269), 1995, TR.

Scattered in Sussex and increasing in England (Rich & Woodruff 1996). Native in North America.

***Erigeron canadensis (Conyza canadensis).* Canadian fleabane.**

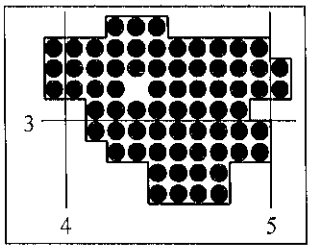


Tetrad 43H (Hall 1980).

Still scarcely established on the Forest and usually recorded as a single plant such as one plant at Wych Cross garage (419.329), 1995, HP & TR, though more frequent in Forest Row and hitching lifts in the slipstreams of traffic on the A22.

A species from tropical America first recorded in the London area in 1690, and now common on waste ground, walls, etc. throughout southern Britain, but surprisingly it is still very rare in Ireland. Native in North America.

***Bellis perennis.* Daisy.**

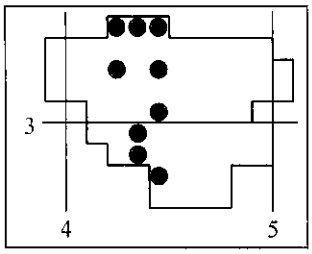


Recorded in virtually every square on the Forest, usually on richer soils on lawns, meadows, car parks and playing fields. Almost certainly absent from 43.31 where it has been searched for.

The flowering heads close at night and open in the light, hence the name 'day's eye'. Plants on very dry soil in Cackle Street during the 1995 drought had capitula only 10 mm in diameter, half the normal size.

Ubiquitous in Sussex and Britain. West, central and southern Europe, and western Asia.

***Tanacetum parthenium (Chrysanthemum parthenium).* Feverfew.**

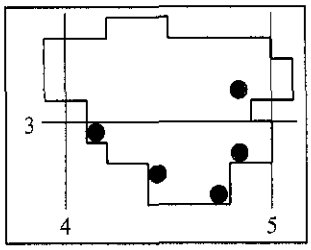


Poundgate (Wolley-Dod 1937). Five tetrad records (Hall 1980).

A garden plant scattered in the villages and occasionally introduced with foreign soil on the Forest. Seedlings mysteriously appeared on TR's front path in 1995, probably from mud on boots.

Widely distributed in Sussex, lowland Britain and Europe, often associated with habitation and especially frequent in urban areas. Once cultivated as a medicinal plant. Probably native in south-east Europe and Asia Minor.

Tanacetum vulgare. **Tansy.**

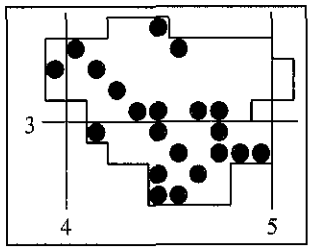


Tetrad 42N (Hall 1980).

Five scattered records from verges, villages and rough grassland around the edges of the Forest.

In Europe it is probably a natural component of some maritime, lake shore and riverside communities in north-west Europe, and is also widespread as a ruderal where it has frequently been introduced (Clapham 1953). This pattern is repeated in Sussex and Britain, and it is accepted as a native species.

Artemisia vulgaris. **Mugwort.**



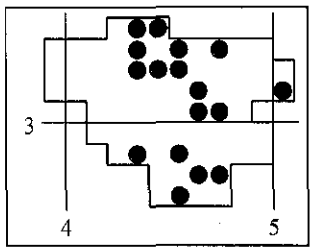
Common on the Forest (Hall 1980).

A characteristic place to find this is along the very edges of verges on the A22 where it is mown short and rarely flowers. It is also established on waste ground in the villages.

This species is unusual in the Asteraceae in being wind-pollinated. It is the third most common cause of hay fever in Scandinavia, but seems to affect few people in Britain unless they have already been sensitised to mugworts and wormwoods abroad (Rich 1994b).

Very common in Sussex but avoiding the Wadhurst clay. Widespread in lowland Britain and Europe.

Achillea ptarmica. **Sneezewort.**

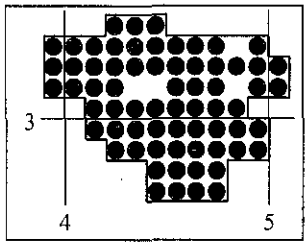


Common on the Forest (Hall 1980).

Scattered mainly in the wetter meadows and pastures in the central and northern areas of the Forest, and in ditches.

Locally frequent in the Weald on acidic soils, and still widespread in lowland north and west Britain but declining nationally due to drainage of wet grassland. Widespread in northern Europe.

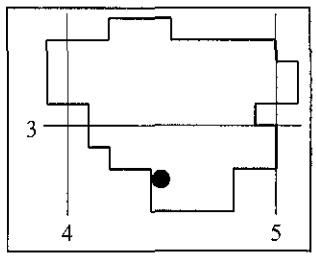
Achillea millefolium. **Yarrow, Nosebleed.**



Common on roadsides and in grassland. White- and pink-flowered plants were noted growing together in Forest Row (44.34), 1994, TR.

Ubiquitous in Sussex and Britain. Widespread in Europe and western Asia.

Chamaemelum nobile. **Chamomile.**



Although previous floras describe it as "frequent" (Arnold 1907) and "rather frequent" in Sussex (Wolley-Dod 1937), the only previous records traced are 'on Ashdown Forest' (Coleman 1836), Ashdown Forest, 1921, H. Mace (BRC), and Forest Row, 1938, G. E. Shaw (**TLS**). It was recorded sometime up to 1980 in the Fairwarp tetrad 42T (Hall 1980) but not refound or localised. It was also recorded outside the Flora area on verges near Stumblewood Common (403.307), 1950s, FR; the verges are now tall grass or are shaded and the plant has gone. It is sometimes also planted on lawns, as at Buxted Park (1995, PD) or Old Lodge (now gone; S. Stewart, pers. comm. 1995).

Ford's Green, hundreds of vegetative plants on football pitch, and a few on the cricket pitch (445.271), 1993, TR. Ford's Green is part of the common land of Ashdown Forest, and was sheep-grazed until the 1950s when the main duty of the greenkeeper was to sweep the droppings off the cricket pitch (J. Walters, pers. comm. 1995). During the winter of 1994/1995 the pitch was heavily trampled as it was one of the few dry pitches in the area. By the end of the winter it was a sea of brown mud and had sand sprinkled on it to help the playing surface. This gave rise to concern for the chamomile but in the summer it was even more abundant and flowered profusely. The severe drought turned the remaining grass brown but the chamomile stayed green and stood out very clearly. It flowers most profusely on the Green in dry summers when it is not mown.

It grows with *Achillea millefolium,* which is very similar in leaf but not in flower. *Chamaemelum* has creeping stems which form patches, the leaves are smaller and have fewer segments and the leaf tips lack the long hair point of *Achillea* (small hair points may be present on some leaves); the smell is distinctive to some people but not others. Similar plants

recorded with *Chamaemelum* are *Matricaria recutita, M. discoidea,* and *Tripleurospermum inodorum*. A survey by Heather Winship for Plantlife and Hampshire Wildlife Trust in 1993 showed that *Chamaemelum* was declining nationally (Winship 1994). In East Sussex in 1993, Ford's Green and Chailey Common were the only known extant sites, and the latter has only one small patch. The single Ashdown locality at Ford's Green certainly merits conservation, if only so that after a football match the Nutley lads will smell a little sweeter than normal!

The flowers were once brewed into a cure-all tea and were highly valued fetching 400 shillings per cwt (Bates 1943). It is still drunk today as a herbal tea.

Chamaemelum was once quite common and widespread in southern England on common land, and it thrived in short, heavily grazed turf, with the accompanying poaching of the ground and dung patches. The post-war decline has followed the decline in pasturing stock on commons in England, and it only remains frequent inland in the New Forest and on Dartmoor which are still grazed. Studies of the genetics have shown that many populations now have very little variation (Kay & John 1995). Recently, it has been increasingly noticed on sports fields derived from old common land, where the mowing and trampling mimic grazing. The occurrence of hundreds of plants at Ford's Green is therefore quite typical. The soil pH where it was most abundant was 4.9, and it did not occur where the soils had a higher pH from the lime used to mark the pitches. It could also survive elsewhere on the Forest on lawns.

It mainly occurs in western Europe and North Africa

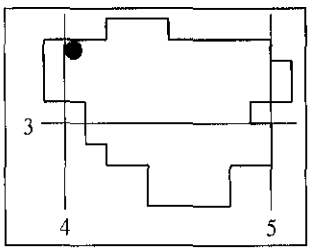
Anthemis arvensis. **Corn chamomile.**

Barnsden, near Nutley, and Forest Row, E. M. Day (Wolley-Dod 1937). Tetrad 42T (Hall 1980).

Not refound, perhaps not surprisingly for an arable weed which is decreasing in England (Rich & Woodruff 1996). In Sussex and elsewhere it is now an uncommon arable weed of the chalk (Wilson 1994), and occasionally occurs as a contaminant of continental seed mixtures with other arable weeds such as *Agrostemma githago* and *Chrysanthemum segetum*.

It is widespread in Europe, Asia and North Africa, and has been widely introduced elsewhere as a weed.

Anthemis cotula. **Stinking chamomile.**



Five tetrad records (Hall 1980).

One plant in gateway, south-west of Mudbrooks House (402.338), pH 5.4, 1995, Flora meeting.

This is a annual weed which is variable in size and habit. It occurs most frequently on heavy clay and clay-loam soils, especially if they are base-rich, and our site on mildly acidic clay may not be very suitable for it (hence only one!). Germination takes place mainly in the autumn and spring depending on cultivation, but can occur throughout the year. It is self-incompatible and requires cross-pollination, so our isolated plant may not have set seed (Kay 1971; Wilson 1994).

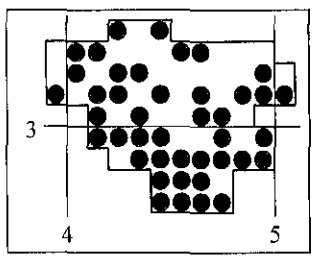
Frequent on heavy soils in the Weald. Widespread but decreasing in lowland south-east England and possibly climatically limited by cooler temperature and increasing rainfall to the north and west (Kay 1971; Rich & Woodruff 1996). Widespread in Europe north to England and Finland but probably native around the Mediterranean, western Asia and north-east Africa.

****Chrysanthemum segetum.*** **Corn marigold.**

Ashdown Forest, 1921, H. Mace (BRC), we presume recorded from arable land.

Another arable weed which is decreasing in England and has not been refound. It is now very scarce in Sussex. Europe and western Asia.

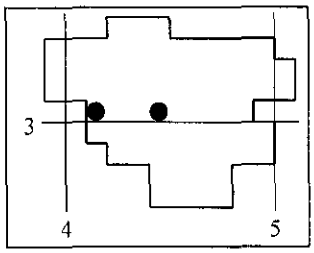
Leucanthemum vulgare. **Oxeye daisy, Horse daisy, Midsummer daisy, Dog daisy.**



Scattered on verges and in pastures and lawns, most frequent on the more calcareous soils on the south side of the Forest. Usually conspicuous in flower in May and June, but in the mild weather of October 1995 some flowered again after the summer drought.

Recorded in 92% of the Sussex tetrads (Hall 1980). Widespread in Britain and Europe.

***Leucanthemum* × *superbum* (*L. maximum*).** **Shasta daisy.**

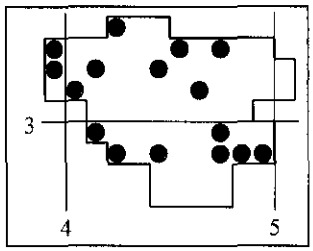


Tetrad 42J (Hall 1980).

Road verge near Birch Grove House (413.304), 1993, Flora meeting; near Home Farm (44.30), 1993+, SBRS.

Occasionally recorded as a garden escape in Sussex, and increasingly so in England (Rich & Woodruff 1996). It originated in cultivation.

***Matricaria recutita* (*Chamomilla recutita*).** **Scented mayweed.**

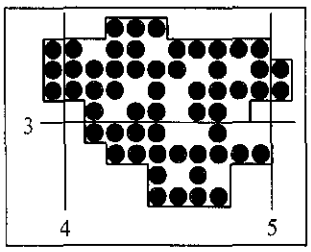


Common on the Forest (Hall 1980).

Scattered around the Forest often on roadsides and in gutters, and occasionally as a weed in gardens and flower beds.

Common in Sussex. Locally common in non-calcareous, loamy soils in Britain (Wilson 1994) and increasing in England (Rich & Woodruff 1996). Widespread in Europe and Asia west to India.

***Matricaria discoidea* (*M. matricarioides, Chamomilla matricarioides*).** **Pineapple-weed.**

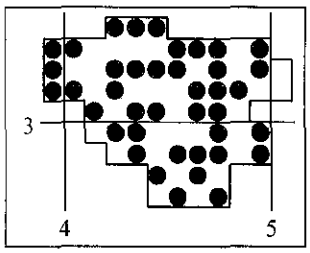


The first record we have traced is for Forest Row, 1910, Miss P. Stockdale (**BEX**), only a few years after the first confirmed Sussex record from Lewes in 1901 (Wolley-Dod 1937). Common on the Forest (Hall 1980).

Widespread in gateways, gardens, car parks, road verges and on waste ground. It is absent from the heathy areas.

Recorded in Sussex in 98% of the tetrads (Hall 1980). First recorded in Europe in 1852 and from Britain in 1871, and now very widespread and still increasing in Britain (Rich & Woodruff 1996). Native in north-east Asia.

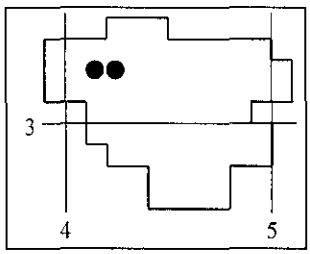
***Tripleurospermum inodorum*.** **Scentless mayweed.**



The commonest mayweed on the Forest, on verges, road gutters, arable land, waste ground and other disturbed open habitats.

Recorded in 95% of the tetrads in Sussex (Hall 1980). The commonest mayweed in Britain (Wilson 1994). Widespread in Europe and western Asia.

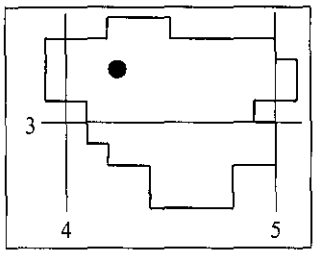
***Senecio cineraria*.** **Silver ragwort.**



Waste soil in council dump, Wych Cross (419.320), 1994, DK; disturbed verge near Ashdown Park (429.323), 1993, TR & EL. Not persistent in either locality.

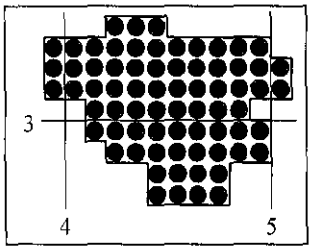
Established by the sea in Sussex, and increasing in England (Rich & Woodruff 1996). Native in west and central parts of the Mediterranean.

***Senecio* × *albescens* (*S. cineraria* × *jacobaea*).**



Disturbed verge with *S. cineraria* near Ashdown Park (429.323), 1993, TR & EL, possibly imported with soil rather than originating *in situ*, but not persisting. It is occasionally recorded in Britain near habitation where *S. cineraria* is cultivated.

***Senecio jacobaea*. Common ragwort.**



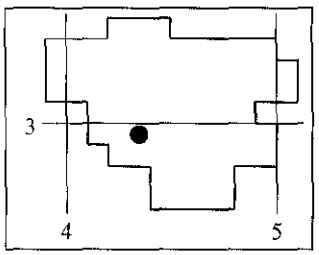
Recorded in every square. Frequent on roadsides, but much rarer on the heaths and then usually on the rides or on imported soil used to make up the paths. It mysteriously disappears shortly after coming into flower on the verges as it is controlled on some of the chases by hand pulling (*AFN* 30:3), which usually takes about 4-5 years to eradicate it.

The plant contains alkaloids which are poisonous to most herbivores except some specialist invertebrates. Defoliation by the striking black-and-orange cinnabar moth larvae can markedly affect its seedling establishment, rosette growth and flowering. The effects are most pronounced when defoliation occurs in combination with unfavourable weather such as a dry spell. It is often abundant around warrens as it is not eaten by rabbits, and selective grazing of other species can give the ragwort a competitive advantage as well as creating the open ground that it needs to regenerate in (Prins & Nell 1990).

Ragwort has been introduced to New Zealand where it is a serious weed, and there have been attempts to control it with cinnabar moths sent from England (Imms 1947). Initially the moths did well but then slowly declined, reputedly due to predation by birds. The bright colours of the larvae - which in England would be a warning to birds - were ignored and the local birds gorged themselves until they couldn't fly! Another possible reason was that a native parasitoid of an indigenous moth also parasitised the cinnabar moths (Samways 1981). Another insect, the ragwort seed-fly, was also sent with better success.

Recorded in 98% of the tetrads in Sussex (Hall 1980). Widespread and increasing in England (Rich & Woodruff 1996), and widespread in Europe and western Asia.

***Senecio aquaticus*. Marsh ragwort.**

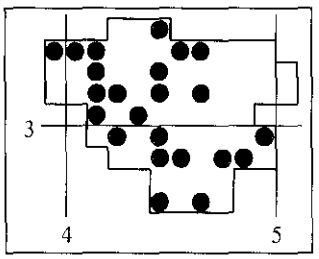


Tetrads 33W, 42N and 43L (Hall 1980).

Millbrook Farm area (43.29), 1994, SBRS (AK, AH, etc.). Amazingly rare for a plant of wet acidic grasslands, but it does seem genuinely to be very scarce in this part of Sussex.

Locally frequent in the Weald and along major river valleys in Sussex. Widespread in Britain, especially in the west, but decreasing probably due to drainage of wet meadows (Rich & Woodruff 1996). West, central and southern Europe.

***Senecio erucifolius*. Hoary ragwort.**

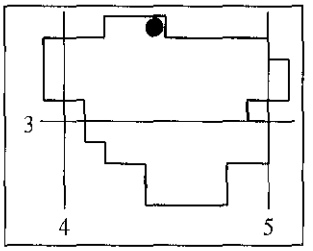


Common on the Forest (Hall 1980).

Usually as scattered clumps on road verges and more frequent on clayey soils. DK is careful not to pull this species when pulling common ragwort, and its apparent frequency compared with common ragwort increases markedly during the flowering season as the ragwort is pulled up and eradicated!

Common in Sussex. Widespread in lowland south-east England, and in Europe except in the north and parts of the west. Also in western Asia.

***Senecio squalidus*. Oxford ragwort.**

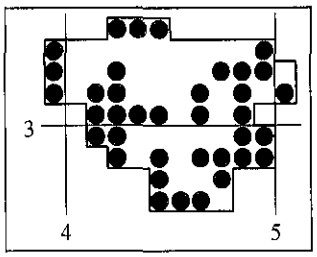


One plant near gate noted during the annual flower show at Lines Farm (444.344), 1995, PW, probably trampled to death later in the day unnoticed by the visitors!

This plant was introduced to Oxford Botanic Gardens and escaped over the wall in 1794 and onto the railway lines and spread through Britain very quickly. Salisbury (1961) noted that the spread was "markedly discontinuous with respect to the more remote infections, whilst at the same time spreading locally around each new station". It is mainly established in the Brighton area in Sussex and is more scattered elsewhere.

Widespread in lowland south-east England. It is an endemic of the mountains of central and southern Europe.

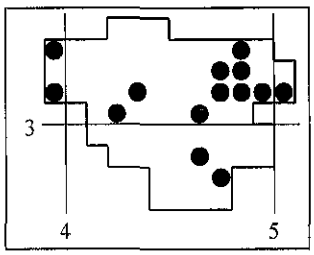
Senecio vulgaris. **Groundsel.**



Car parks, gardens, occasionally as an arable weed, pavements, and road verges. Scattered mainly around the edges of the Forest.

Recorded in Sussex in 98% of the tetrads (Hall 1980). Ubiquitous in Britain, and widespread in Europe, Asia and North Africa.

Senecio sylvaticus. **Heath groundsel.**



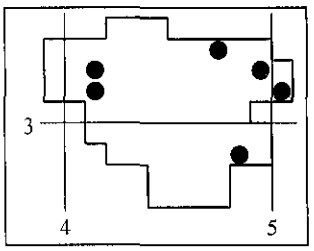
Tetrads 42N, 43G and 43R (Hall 1980).

Scattered in heathy areas on rides and the edges of tracks, mainly in the north-east corner of the Forest around Five Hundred Acre Wood, and sometimes locally abundant after disturbance (e.g. Raven Wood 433.312, 1995, TR).

Like *S. viscosus* but with fewer glands which are often sticky, usually a taller plant, and with short outer phyllaries usually less than 1/4 of the length of the inner ones, and minutely hairy seeds (×20 lens); *S. viscosus* has outer phyllaries 1/3-1/2 as long as the inner ones and glabrous seeds. Dwarf plants should be carefully checked.

Locally frequent on the Tunbridge Wells Sands in Sussex, and very much a calcifuge. Widespread in Britain and decreasing in England (Rich & Woodruff 1996). Widespread in Europe and western Asia on sandy soils.

****Senecio viscosus.*** **Sticky groundsel.**



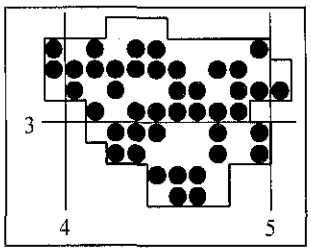
Tetrads 42Z and 43H (Hall 1980).

We have a few scattered records; waste ground at Wych Cross Place (419.319 and 419.321), 1994/5, TR; one plant on set-aside land near Tile Barn Farm (474.336), 1993, PW; Poundgate (48.28), 1994, PW; disturbed soil on verge, Marden's Hill (499.325), 1993, TR; St John's (50.31), 1993, ER, RN & NN. It is much rarer than *S. sylvaticus* and occurs in secondary habitats.

This annual germinates in the spring and flowers in midsummer; seeds produced late in the season are often not viable (Salisbury 1964). It seems to be quite drought-tolerant and often grows in bare, dry, open habitats.

Scattered in Sussex and mainly associated with railways. Widespread in lowland Britain. Native in Asia Minor and central Europe but introduced to the north and west.

Tussilago farfara. **Colt's-foot.**



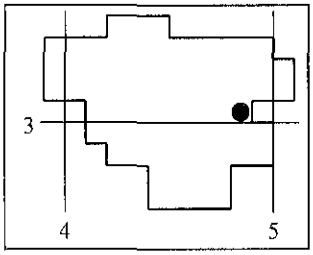
Widespread around the Forest usually on disturbed soils and verges.

This species is a native of damp, calcareous soils in Britain, often associated with wet seepage zones and damp clays. It has been widely used as a medicinal plant for treating asthma and has presumably become more widely introduced as a consequence (Clapham 1953).

It is unusual in that it flowers very early in the year before the leaves are produced. The centre of the inflorescence contains 40-50 short male flowers surrounded by about 300 longer female flowers; only the male flowers produce nectar and they open first which minimises self-pollination. The cottony fruiting heads soon look tatty but the pappus is very effective in dispersing the seeds over long distances. The seeds are only viable for a couple of months and have to germinate and establish rapidly before the summer.

Recorded in 91% of the tetrads in Sussex (Hall 1980). Widespread in Britain and Europe, Asia and North Africa.

Petasites hybridus. **Butterbur.**

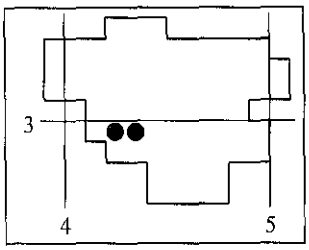


Above waterfall, Old Mill Farm (487.302), 1995, RN & ER. This is our only record and it was nearly lost with the rest of the day's recording when RN's notebook slithered down the sheer side of the deep gorge; in true pioneer spirit she followed and recovered it at no small risk to life and limb.

It is also scattered down the Medway but under-recorded in Hall (1980). All the Sussex plants seen are male and have spread vegetatively or and may have been planted for early nectar for bees. The females mainly occur in central and northern England.

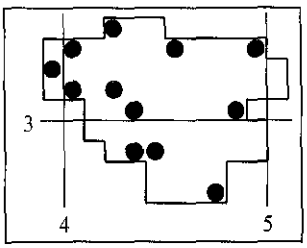
Widespread in Europe, though as female plants are absent or rare it may have been widely introduced. North and west Asia.

Petasites japonicus. **Giant butterbur.**



Planted at Chelwood Vachery in bog garden (42.29 and 43.29), but not yet naturalized. Native in eastern Asia.

Petasites fragrans. **Winter heliotrope, Sweet-scented coltsfoot.**

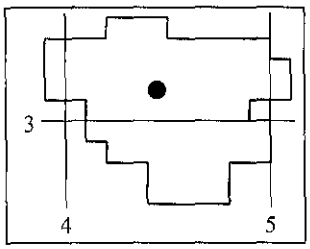


Frequent on the Forest (Hall 1980).

Scattered on and around the Forest usually near habitation. It spreads vegetatively and forms large patches, sometimes dominating verges for hundreds of yards as by Horncastle House (391.324), where it was recorded in 1945 by G. Dent. Some material in Forest Row was in flower as early as November in 1994 in the exceptionally mild winter.

Scattered in Sussex and lowland Britain, again usually near habitation. Possibly native in the central European region.

Bidens cernua. **Nodding bur-marigold.**



Forest Row, 1910, Miss P. Stockdale (**BEX**). Newbridge, 1965 (*Bulletin Kent Field Club* 11: 27). Tetrad 42N (Hall 1980).

One plant only recorded in the dried-up parts of the stream bed in Pippingford Park about 100 metres south of Centre Bridge (449.316), HP, 1995.

This species is typical of exposed muddy shores of ponds and lakes. It is an annual which grows rapidly in the nutrient-rich conditions, and it flowers in late summer. The barbed fruits attached themselves readily to clothing and are difficult to remove.

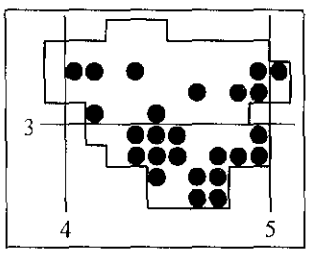
Locally abundant in lowland Britain. Widespread in Europe except the far north and much of the Mediterranean, and in northern Asia.

Bidens tripartita. **Trifid bur-marigold.**

Newbridge, 1965 (*Bulletin Kent Field Club* 11: 27).

Not refound. A species similar in ecology and habitat to *B. cernua.* Salisbury (1970) thought it was more common in acidic sandy areas than *B. cernua,* but this is not borne out in Hall (1980) where both species occur in similar places. It is locally abundant in lowland Britain, Europe and Asia.

Eupatorium cannabinum. **Hemp-agrimony.**



Common on the Forest (Hall 1980).

Scattered on roadsides, ditches and stream sides mainly on the south side of the Forest. It is very attractive to butterflies.

Very common in Sussex in a range of habitats. It does not seem to have many ecological limitations in Britain, occurring on a wide range of soils and sites. It is widespread in Europe, Asia and North Africa.

ALISMATACEAE

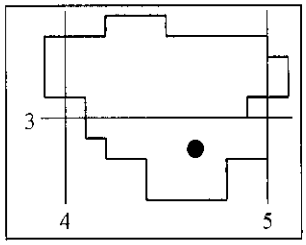
Sagittaria sagittifolia. **Arrowhead.**

Cackle Street, 1933, G. Dent (Dent 1928-1953). Tetrad 43V (Hall 1980), possibly planted.

One *Sagittaria* plant, possibly *S. sagittifolia,* was discovered introduced with other aquatics to a pond on the golf course, Forest Row (436.342), 1995, PW, and was destroyed the same day when the pond was cleared out.

Common along the main river courses in Sussex and their associated ditch systems but rare elsewhere. Widespread in lowland Britain, and in Europe except for the northern and southern extremities. Asia.

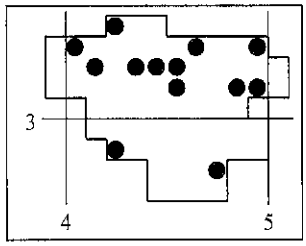
Sagittaria latifolia. **Duck-potato.**



Probably introduced with other aquatics, Ellison's Pond (462.288), from where it has been known since 1985, AH.

It has been introduced to several European countries, and is naturalized in a few sites in southern Britain but does not seem to spread far from the initial sites. It is widespread as a native in wetlands in the Americas, and American Indians once used the starchy tubers for food.

Alisma plantago-aquatica. **Water-plantain.**



Common on the Forest (Hall 1980).

A few scattered records in ponds around the Forest but not found in the more acidic, nutrient-poor water.

It is a widespread and very characteristic species of damp mud and shallow water throughout the British Isles in lakes and ponds, rivers, streams and ditches. It tends to grow in open vegetation and is an early colonist of new sites. It grows especially well in nutrient-rich water. In water over 65 cm deep it apparently survives vegetatively but will not flower. The flowers are reputed to open in the afternoon.

It is widespread in Sussex and is native in temperate Europe and Asia.

[***Alisma lanceolatum.*** **Narrow-leaved water-plantain.**

Once recorded in the *Botanist's Pocket Book* for Ashdown Forest (Wolley-Dod 1937) but not seen in our survey. Given the frequency with which it is confused with juvenile *A. plantago-aquatica* and its rarity in acidic water, the original record must be in some doubt.

It grows in similar places to *A. plantago-aquatica* but is generally much less common and certainly so in Sussex. It is widespread but uncommon in southern Britain, and widespread in Europe except the north. Also in western Asia and North Africa.]

Damasonium alisma. **Starfruit.**

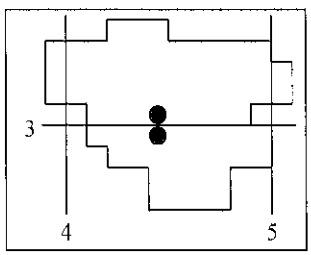
Ashdown Forest, *New Botanist's Guide* (Arnold 1887) but now long extinct.

This is a Red Data Book species which used to occur on the drying mud around ponds where they were kept open and trampled by cattle. It is no longer to be found anywhere in Sussex, and is extremely rare in England. Birkinshaw (1994) has reviewed its conservation in western Europe, and steps are being taken to conserve it in its few remaining sites in Surrey and Buckinghamshire; no plants were seen in Britain in 1995 (Rich *et al.* 1995).

It occurs in western, southern and south-east Europe, Asia and North Africa, with England being its northern limit.

HYDROCHARITACEAE

Stratiotes aloides. **Water soldier.**

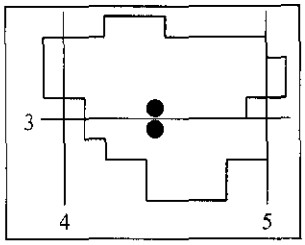


Ponds in Pippingford Park at 448.299, 1995, TR and 444.301, 1993, SBRS, a deliberate introduction in both cases.

This aquatic species is noted for the unusual way in which it spends the autumn and winter submerged, and then rises to the surface in the spring and summer, but the mechanism for this has never been satisfactorily explained (Sculthorpe 1967). The rosettes put out shoots which form little rosettes at their tips, and it can rapidly grow to fill a pond. It is dioecious but rarely seems to flower in Britain and fruit set has not been observed (Mountford 1994). Female plants are reputed to dominate in Britain and the northern part of its range, and male plants mainly dominate in the south, but the sexes overlap in the middle part of its range.

As a native in Britain it is now largely confined to the Norfolk Broads and is a Nationally Scarce Species (Mountford 1994). In Sussex it could be native on Pevensey and Lewes levels. It has been introduced to many places in the Midlands and the south-east. Widespread in Europe though rarer in the west and south, and in north-western Asia.

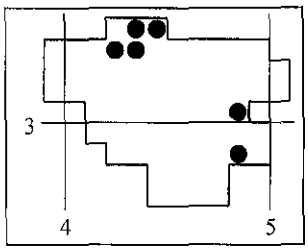
Elodea canadensis. **Canadian waterweed, Canadian pondweed.**



We have two records from small ponds in Pippingford Park at 444.301, 1993 and 448.299, 1995, both SBRS, and both obviously introduced with other aquatics. It does not grow well in acidic, nutrient-poor water which may explain its absence from the Forest.

First recorded in Britain in 1836, and one of the earliest aquatic aliens to be introduced into Britain from North America. It is locally frequent in Sussex, and is now relatively common in Britain (Simpson 1984) and naturalized world-wide.

Elodea nuttallii. **Nuttall's waterweed.**

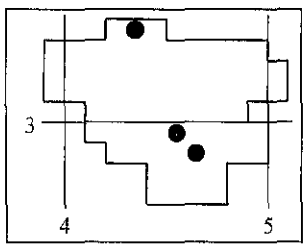


We have records from ponds in the Forest Row area, a new pond near Poundgate (484.288), 1994, SBRS, and new pond west of Old Mill House (482.303), 1995, TR. It is significantly more common in the Forest area than *E. canadensis* but has also not been reported previously.

Both *Elodea nuttallii* and *E. canadensis* show a wide range of variation which is mainly due to the growth conditions (Simpson 1988). Only female plants of both species are present, and in the summer, pink flowers on long stalks can dot the water surface. *E. nuttallii* can be easily distinguished as the narrower leaves curl backwards like an arm twisted behind a back.

This is a more recent introduction to Britain than the last species, having been first recorded in 1966. It is scattered in Sussex and is increasingly common in England (Rich & Woodruff 1995) and scattered in Scotland, Wales and Ireland. A native of North America.

Lagarosiphon major. **Curly waterweed.**



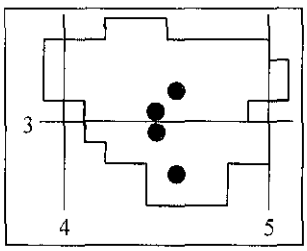
Pond on the edge of the golf course at Forest Row (436.342), 1993, TR; pond in Pippingford Park (450.298), 1992, PW; Ellison's Pond (462.288), 1993, TR.

It is more common now than as noted in the *Sussex Plant Atlas*. A native of South Africa, commonly used by aquarists and increasingly naturalized in England (Rich & Woodruff 1995). Also naturalized in a few European countries.

Readily distinguished from the *Elodea* species by its larger size and spirally arranged leaves (whorled in *Elodea*).

APONOGETONACEAE

Aponogeton distachyos. **Cape-pondweed.**



Hall (1980) gives a pond at Nutley (42N) as the only Sussex locality for this plant.

We have four records. One of these is from the same tetrad as Hall's record but the site, a dammed stream near Lower Misbourne Farm (456.272) is not a pond and the record may have been from Boringwheel Mill pond to which we have not had access. It is well-established in the main lakes at Pippingford, where it was probably planted but is now naturalized, 1993+, SBRS.

A native of South Africa, frequently planted in ponds and naturalized in scattered localities in Britain.

JUNCAGINACEAE

Triglochin palustre. **Marsh arrowgrass.**

On the bogs on Ashdown Forest, not uncommon (Forster 1816; no specimen in **BM**).

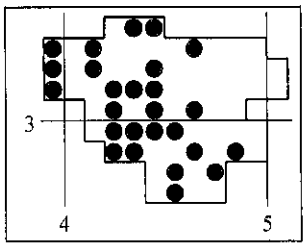
This species of wet grassland, ditches and heathland flushes has not been recorded again, and we wonder if the original record was correct though it is difficult to see with what it can have been confused. It is a very uncommon plant in Sussex, but has been recorded on St Leonard's Forest (Hall 1980).

Widespread in Britain but commonest in the north and west, and in Europe except the Mediterranean region. It also occurs in North Africa, northern Asia, North and South America and Greenland.

POTAMOGETONACEAE

The monograph of the British species by Preston (1995) is now the standard guide but was not published until we had finished our survey! It might have helped to clarify some of the problems we have had distinguishing plants of *P. natans* and *P. polygonifolius* from dried-up ponds during the 1995 drought.

Potamogeton natans. **Broad-leaved pondweed.**

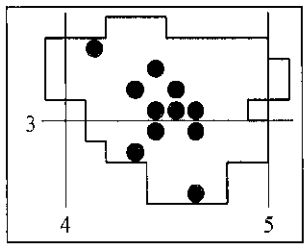


Frequent on the Forest (Hall 1980).

Common in suitable habitats during our survey, occurring generally in deeper water in the bigger ponds and lakes and often forming large patches by itself. It tends to occur in open water but will persist in ponds for some time as they become grown over and shaded. It has a broad range of water tolerance from nutrient-poor to nutrient-rich conditions. One cattle trough on The Farm (393.329), 1995, TR, had a good patch growing well in clean tap water. It is also planted in some ponds, as in new ponds in Pippingford Park.

Widespread in Sussex except the west, and throughout the northern hemisphere.

Potamogeton polygonifolius. **Bog pondweed.**

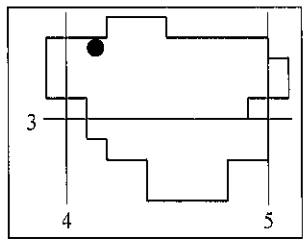


Ashdown Forest, abundant, E. Jenner (Arnold 1887). Ashdown Forest (Whitwell 1902). Pools on Ashdown Forest near Gills Lap, etc. (Done 1914). Six tetrad records for the Forest (Hall 1980).

It occurs in the smaller flushes and shallow ponds on acidic soils, and has even been seen in a dried-up, shaded stream in Southbank Wood (433.315), 1995, TR. Although associated particularly with more acidic habitats, it is less common on the Forest than the previous species, presumably because it has more specialised requirements.

It is occasional in the Weald. Common throughout Britain, and mainly in western and central Europe. It also occurs in north-western Africa and eastern North America.

Potamogeton berchtoldii. **Small pondweed.**



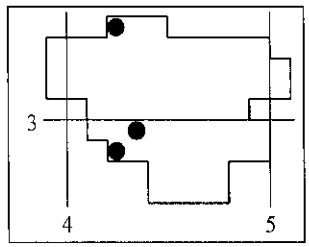
Recorded in the pond near Newgale Farm, 1988, PW (confirmed by E. G. Philp) which is the record in Briggs (1990).

Not present in 1994, but refound again in abundance around the margins in 1995 after the pond had been opened up. Some plants had unusually wide leaves (2.2 - 2.4 mm) which were at or slightly beyond the widest value (2.3 mm) given in Preston (1995). Waterfowl were observed to eat it.

Occasional in Sussex. Scattered throughout Britain and much of the northern hemisphere in a broad range of aquatic habitats and water quality conditions.

ARACEAE

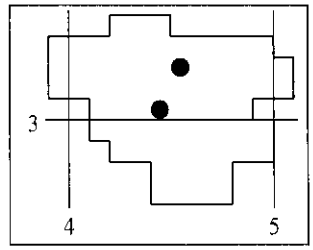
Lysichiton americanus.* **American skunk-cabbage.



Planted and spreading in Maskett's Wood (428.285), 1995, Flora meeting; planted at Chelwood Vachery in bog garden (429.296), 1994, MR, PR & TR; spreading down stream at Kidbrooke (420.345), 1995, TR.

Introduced and increasing in England (Rich & Woodruff 1996). Native in western North America where it grows in similar boggy, wet woodlands.

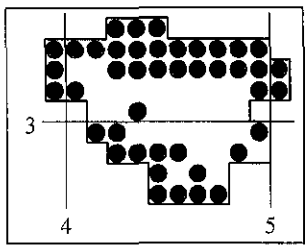
Calla palustris.* **Bog arum.



Planted in pond in Pippingford Park (444.301), 1993, SBRS; one plant in iron flush in shaded alder wood at Newbridge (455.323), 1993, PD & TR, presumably spread down the stream from Pippingford Park. This is the first naturalized record for East Sussex.

Occasionally naturalized in Britain and Ireland. Native in Europe, North Asia and North America.

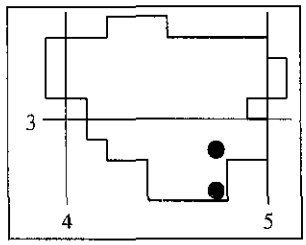
***Arum maculatum*. Lords-and-ladies, Cuckoo pint, Lily grass, Small dragon, Great dragon, Ram's horn, Wake Robin, Schoolmaster.**



Recorded widely around the Forest in hedges, woodland, gardens and road verges, usually on the richer soils.

Recorded in 92% of the tetrads in Sussex (Hall 1980). Widespread in Britain and reaching its northern limit in southern Scotland. Western, central and southern Europe, and North Africa.

***Arum italicum* subsp. *italicum*. Italian lords-and-ladies.**

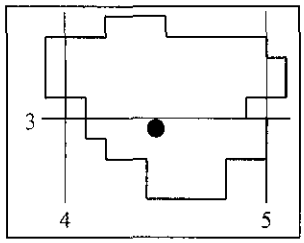


Several clumps established in lane east of ford at Oldlands Farm (476.268), leaping off down lane from the farm garden, 1995, TR & PA; one plant in hedge by Duddleswell cross-roads (471.288), 1995, RN & ER.

Subsp. *italicum* is increasing as a garden escape in England (Rich & Woodruff 1996), and is native in southern and western Europe and North Africa. None of the native subsp. *neglectum* has been found, and would probably not be expected (Prime, Buckle & Lovis 1955).

LEMNACEAE

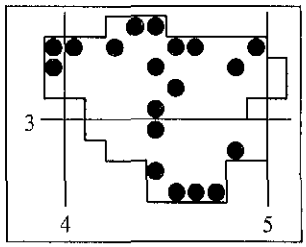
***Spirodela polyrhiza*. Greater duckweed.**



A few plants in a new pond in Pippingford Park (448.299), 1995, TR, where it was probably an accidental introduction with other aquatics.

Locally abundant in rivers, ditches and ponds in Sussex, especially on the grazing marshes of areas such as Pevensey and Lewes, and locally distributed in lowland Britain. Widespread in Europe except the extreme north and south, and many other places in the world.

***Lemna minor*. Common duckweed.**

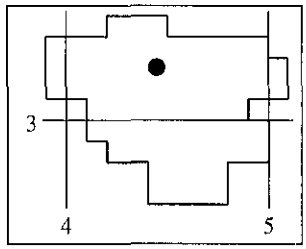


Common on the Forest (Hall 1980).

Scattered mainly around the edges of the Forest, in small flushes, open and shaded ponds, and in the Medway. This is our commonest duckweed, as it is in Britain.

It is widespread in Sussex in a wide range of aquatic habitats and a range of water conditions. *L. minor* is able to grow optimally at lower levels of phosphate in the water than the other duckweeds, whilst *L. minuta* is able to grow at lower nitrogen concentrations (Lööund 1980). It occurs throughout lowland Britain and Europe.

***Lemna trisulca*. Ivy-leaved duckweed.**

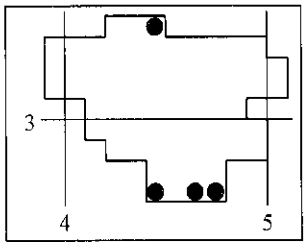


Tetrad 43B (Hall 1980).

Pond at Ridge Road (446.328), 1993, TR, but not seen in 1995.

This submerged duckweed is quite shade-tolerant, often growing under other floating aquatics and may not be noticed unless fished out with a grapnel or stick. It is locally distributed in Sussex, and widespread in lowland Britain and Europe. It is cosmopolitan except for the polar regions and the tropics.

***Lemna minuta (L. minuscula).* Least duckweed.**

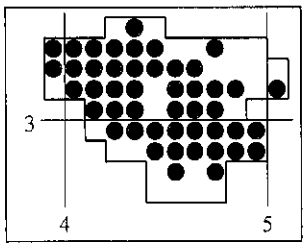


Pond south of Nutley (447.263), 1993, MM; Marlpits pond (467.263), 1993, TR & NM; pond in Furnace Wood (476.260), 1995, TR; pulled up on grapnel with *Callitriche* from River Medway (443.349), 1995, AK & TR, but only noticed when we tried to identify the *Callitriche* at home!

This species was first recognised in Britain in 1977 (Leslie & Walters 1983), and has definitely been spreading ever since and was not just overlooked. It was not recorded in Hall (1980) and only a few times in Briggs (1990), but has continued to spread since. It is now widespread in southern Britain. Native in North and South America.

JUNCACEAE

***Juncus squarrosus*. Heath rush, Goose corn.**



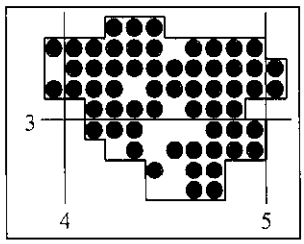
On Ashdown Forest, not common (Coleman 1836). Near Pippingford, 1904, J. Stirling (**TLS**). Thinly scattered on Ashdown, near Gills Lap, etc. (Done 1914). Forest near Pippingford, J. Stirling; Ashdown Forest, locally common, A. H. Wolley-Dod (Wolley-Dod 1937). Common on the Forest (Hall 1980).

Widely distributed on rides, acidic grassland and wet patches on heathland, tolerant of grazing and trampling. It is a very characteristic heathland species.

This species keeps its place in the vegetation by forcing its leaves outwards and down, pushing its competitors out of the way. The patches slowly increase in size and eventually form rings as they decay in the centre. At King's Standing it is frequent in trampled areas near the car park, forming small patches and decaying rings mostly up to 20 cm diameter.

Widespread in northern and western Britain, and on the heaths in East Anglia, the Weald, Surrey and the New Forest. Central, western and north-west Europe, Greenland and North Africa.

***Juncus tenuis (J. macer).* Slender rush.**

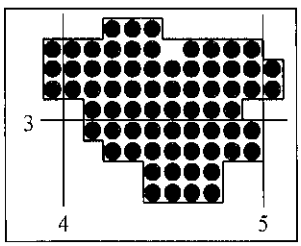


Newbridge, near Coleman's Hatch, Miss K. Pickard; near Old Mill, Crowborough Warren, T. Hilton; near Maynard's Gate, A. H. Wolley-Dod; in two spots near Wych Cross, A. H. Wolley-Dod (Wolley-Dod 1937), and described as rare but spreading. Abundant on paths, Hindleap Warren and Broadstone Warren, 1948, R. A. Boniface. Frequent on the Forest (Hall 1980).

Widely distributed on tracks, around car parks and especially on rides in woodlands, often in damp, shaded situations but also sometimes in dry, open places. Its spread seems to be especially associated with forestry operations.

Becoming widespread in Britain, especially in the north and west, and naturalized in northern, western and central Europe. It is native in North and South America.

***Juncus bufonius sensu stricto*. Toad rush.**

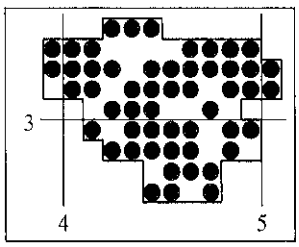


Common on the Forest (Hall 1980).

Common everywhere on rides, pond edges, damp patches, disturbed clayey ground, car parks and sometimes road gutters.

It mainly grows on open mud of pH 4-5, but will grow on other soils too, with an estimated seed output of 13-15 million seeds per square metre (Salisbury 1970). It is one of the most widespread mud species, almost cosmopolitan, and increasing in England (Rich & Woodruff 1996).

***Juncus articulatus (J. lampocarpus).* Jointed rush.**



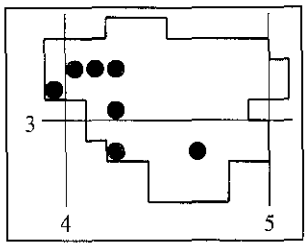
Ashdown Forest (Done 1914). Common on the Forest (Hall 1980).

Widespread but not common on the Forest, usually on open sides of streams and ponds where the vegetation is slightly open, sometimes on woodland rides in unshaded places.

Widespread in Britain and Europe, and in the northern hemisphere.

This species and *J. acutiflorus* can be difficult to distinguish until in fruit (Rich & Rich 1988). *J. articulatus* has blackish fruits with a distinct point (acumen) at the tip. *J. acutiflorus* has brownish fruits which taper to the tip.

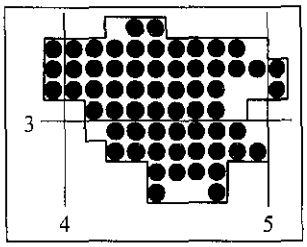
***Juncus* × *surrejanus* (*J. acutiflorus* × *articulatus*).**



Local in flushes often near both parents; the predominance of records on the west side of the Forest may reflect areas botanised intensively by TR who specifically looked for the hybrid.

Widely scattered in Britain and probably much overlooked. The inflorescences are intermediate between the parents, but some plants have large diffuse panicles; for details see Rich & Rich (1988).

***Juncus acutiflorus*. Sharp-flowered rush.**

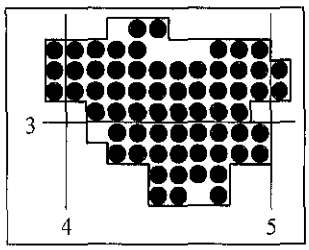


Common on the Forest (Hall 1980).

Widespread and more common on the Forest than *J. articulatus*, but nationally probably less common. It usually occurs in flushes and wet grassland, and sometimes on wet heath mixed in amongst the *Molinia* in quite acidic soils. Sparse patches can also be found in open woodland and mixed with *J. effusus* in flushes.

Widespread in Britain. Western, southern and central Europe, and western North America.

***Juncus bulbosus*. Bulbous rush.**

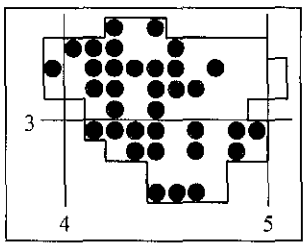


Ashdown Forest, 1895, T. Hilton (**BTN**). Bogs around Crowborough (Done 1914). On a bog between Hartfield and Forest Row, as var. *uliginosus*, E. Forster (Wolley-Dod 1937). Common on the Forest (Hall 1980).

Frequent in deep and shallow water and sometimes in muddy patches on rides, a marked calcifuge. The flowering heads often have small plantlets mixed with flowers.

Common in northern and western Britain, less frequent in the south-east. Widespread in Europe except the south-east; North Africa and North America.

***Juncus inflexus*. Hard rush.**

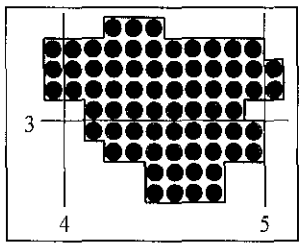


Frequent on the Forest (Hall 1980).

Scattered around the Forest, often on imported soils in and around the car parks. Most frequent on clays, and apparently somewhat calcicolous.

Common on heavy soils in Sussex. Widespread in Britain and Europe north to southern Scotland and southern Sweden. Also in Asia and North Africa.

***Juncus effusus*. Soft rush.**



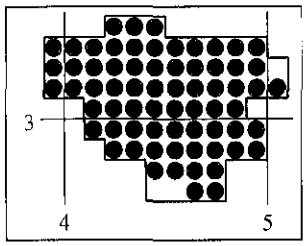
Common on the Forest (Hall 1980).

Recorded in every square. Frequent in wet trampled areas as near King's Standing, and in damp pastures and flushes. It is also characteristic of steep flushes in open woodland where it forms large patches in the wettest areas. Plants can also be found sparsely along the sides of streams in woodland, and occasionally in the wet iron flushes. It is unpalatable to stock and has largely been eradicated from meadows in the area in which it must have once been abundant.

About five plants with loose spiral shoots (the twists completing their turns every 14-15 cm or so, with 3-4 full turns) were found on a track near a hut in Southbank Wood (433.312) in 1995 by TR; the plants may be referred to corkscrew rush (*Juncus effusus* L. forma *spiralis* (J. McNab) Hegi) but were more or less upright and not spreading at the base as described for other plants (Henderson 1992; Nelson 1993; Preston 1994). Plants showing this tendency are not uncommon (e.g. 430.305, PW). This taxon is predominantly found on the west coast of Scotland, and also in Ireland and Wales, with an outlying record from Frensham Pond in Surrey - it may be more widespread.

Throughout Britain. Widespread in Europe, except the Arctic, and the north and south temperate zones.

Juncus conglomeratus. **Compact rush.**

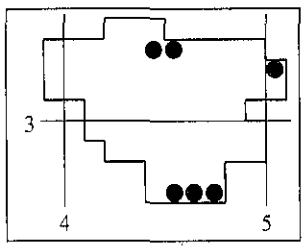


Common on the Forest (Hall 1980).

Recorded throughout the Forest except for three of the marginal squares. It is more typical of the heathlands than *J. effusus*.

Widespread in Sussex. Throughout Britain but less common than *J. effusus*, and usually somewhat more calcifuge. Widespread in Europe, also found in Asia, North Africa and eastern North America.

Luzula forsteri. **Forster's wood-rush.**



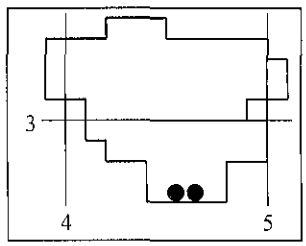
Tetrads 33V, 42T and 43L (Hall 1980), refound in the latter two.

Verge near Coleman's Hatch church (449.338), 1995, PW; locally abundant on lane north-west of Hart's Farm (455.338-459.334), 1995, TR, PW; verge outside Boringwheel Mill (456.263), pH 7.4, 1994, SBRS; banks in coppice woodland, Toll Lane (462.263), pH 4.9, 1993, TR & NM; south bank of lane near Furnace Wood (472.264), 1995, TR; Verge near Hoadley's Farm (508.324), 1993, PW. It typically occurs on partly shaded, sandy, dry banks and in sunken lanes.

Widespread in the Weald, its main stronghold in Britain, and also around London and in south-west England. In Britain it tends to occur on dry banks with weakly acidic to calcareous, free-draining soils. It is widespread in southern, southern-central and western Europe, the Middle East and North Africa and reaches the northern limit of its distribution in England.

It is a very variable species in Europe and local populations in Spain and the Caucasus are often recognised as subspecies; these may have spread from refugia areas in the post-glacial period. *L. forsteri* was described from Britain and our plant is subsp. *forsteri*.

Luzula* × *borreri (L. forsteri* × *pilosa).



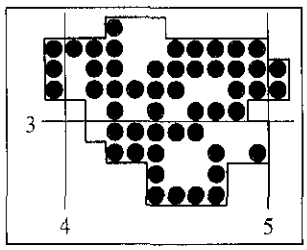
Tetrad 42E (Hall 1980).

We found the hybrid twice, in both cases with the parents: verge outside Boringwheel Mill (456.263), 1994, SBRS; old bank in coppice woodland, Toll Lane (462.263), 1993, TR & NM. Some plants on the lane north-west of Hart's Farm (455.338) may also be hybrid.

This hybrid is intermediate between the parents but shows hybrid vigour and usually produces 0-1(-2) seeds per capsule (see Rich & Rich 1988).

Quite rare in Sussex but probably overlooked to some extent, but recorded occasionally where the parents meet. A record of the hybrid from Ireland (where *L. forsteri* does not occur) is based on a specimen of *L. pilosa* in **CGE**.

Luzula pilosa. **Hairy wood-rush.**

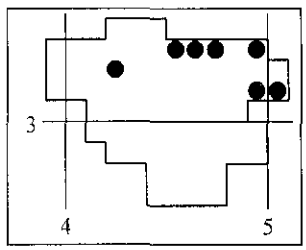


Common on the Forest (Hall 1980).

It occurs mainly around the edge of the Forest in the older woodlands and in the centre is mainly confined to the river valleys; absent from the open, heathy areas. Most of the populations are small, but very locally it may be abundant. It is an evergreen species, typically found often on steep banks and in damp shady places where it will not be covered by leaves during the winter.

It is widespread in the Weald on acidic or neutral soils, and is also widespread in Britain but is oddly rare in Ireland. Widespread in Europe and east to the Caucasus and Siberia

Luzula sylvatica. **Great wood-rush.**



Friar's Gate, C. E. Britten; wood west of Crowborough, R. A. Boniface (Wolley-Dod 1937). Tetrads 42E, 43R and 53B (Hall 1980).

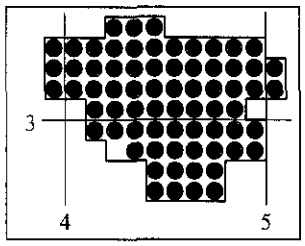
One clump c. 50 cm across in open woodland by path in Broadstone Warren (422.324), 1994, TR; lane north-west of Hart's Farm (458.335), scattered down the river banks from Peculiar's Farm (457.330) to Pooh Sticks Bridge (471.338), 1995, TR *et al.*; steep river bank, Cow Field (495.319), 1995, Flora meeting; stream near Half Moon pub (499.334), 1987, PW & RW; stream near Oak Plat (498.335) and downstream, 1995, TR & PA; outside southern wall of St John's church (503.317), 1993, RN, NN & ER.

This species is palatable and is rapidly eliminated from grazed areas, hence its rarity on the Forest. It is evergreen in the lowlands and may suffer from grazing most during the winter when there is little else for animals to eat. Most of our localities are on steep, inaccessible sides of streams where it is protected from hungry stock by

fences or topography. It may dominate the woodland floor vegetation in the older woodlands, and the isolated clump in Broadstone Warren is presumably a recent colonist.

Very locally frequent in the Weald, especially in rocky woodlands and on acidic soils, but surely not on heaths as suggested by Hall (1980). It is commonest in northern and western Britain and grows at high altitude in the Scottish mountains, usually on ungrazed ledges but also sometimes on open, grazed hillsides where the patches increase vegetatively but rarely flower. It is widespread in southern, central and western Europe occurring mainly in the mountains in the eastern part of its range, and occurs in Asia Minor.

Luzula campestris. **Field wood-rush, Easter-grass, Good Friday grass.**



Common on the Forest (Hall 1980).

Widespread in virtually every square on the Forest. It forms patches in short, unimproved, neutral and acidic grassland, on verges, playing fields, golf course fairways, and especially in lawns. The patches slowly increase in size and eventually the centres may die leaving a ring. It flowers from March onwards, hence the name Easter-grass, and often occurs with *Carex caryophyllea*, but is very difficult to find by midsummer as the leaves die down until the autumn. It is very tolerant of mowing and grazing and is often frequent in mossy, heavily rabbit-grazed areas.

Common and widespread in Sussex and Britain. Widespread in Eurasia, and in the mountains of tropical Africa.

***Luzula multiflora sensu lato*. Many-flowered wood-rush.**

In Britain *L. multiflora s.l.* is usually considered to consist of *L. multiflora* and *L. congesta*. *L. congesta* is an octoploid which is often treated as an infraspecific taxon of *L. multiflora* in Britain but it appears to have been misunderstood due to poor characters being given in the floras (Kirschner & Rich 1993). The two species can be separated as follows:

L. multiflora (Ehrh.) Lej. subsp. *multiflora*: Inflorescences usually pedunculate. Anthers as long as, or up to two times longer than the filaments. Seeds oblong-ovoid, 0.9-1.1(-1.2) mm long, usually 0.8 mm wide.

L. congesta (Thuill.) Lej.: Inflorescence congested, some of the clusters may be pedunculate. Anthers as long as the filaments. Seeds ovoid, 1.2-1.5 mm long, 0.9-1.0 mm wide.

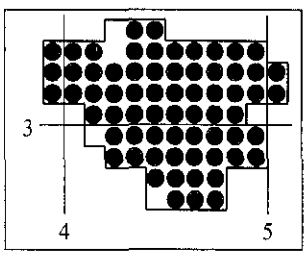
All records for the segregates have been determined by TR from seed measurements. Records for the aggregate are either of vegetative plants or from other recorders.

L. multiflora subsp. *multiflora* is much rarer on the Forest and tends to occur on bare mineral soils in the open as around Gills Lap. It is widespread in Europe, and is itself a complex species in Europe represented by a range of morphologically and/or karyologically distinct populations at various ploidy levels. A hexaploid cytotype (subsp. *multiflora*) occurs in continental Europe and Britain in a range of habitats from the lowlands to the mountains, mostly in meadows and mesophilous woodlands. In geographically or ecologically marginal regions, diploid and tetraploid populations can be found, and a new tetraploid has recently been found in Ireland (Kirschner & Rich 1993, 1996).

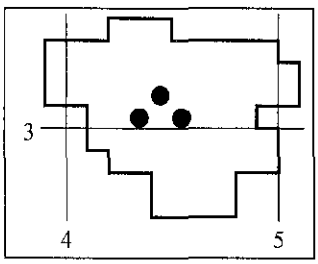
L. congesta is common on rides, in wet heaths and bogs, open woodland, and damp grassland on Ashdown Forest, and seems to be the common widespread plant of most of Sussex. It is an endemic of western Europe. It often occurs on peaty organic soils.

L. multiflora s.l. is common in the Weald in damp acidic habitats and is widespread in Britain.

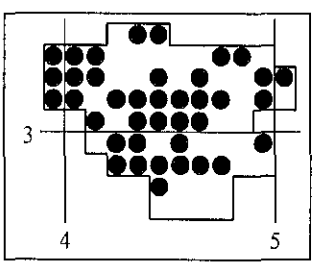
Luzula multiflora s.l.



L. multiflora subsp. *multiflora*
Many-flowered wood-rush

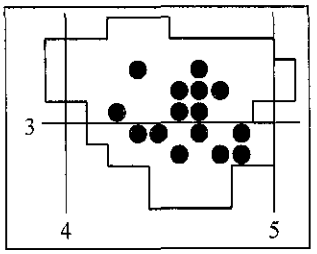


L. congesta
Clustered wood-rush.



CYPERACEAE

***Eriophorum angustifolium*. Common cottongrass.**



Bogs on Ashdown Forest (Coleman 1836). Found in bogs on the Forest in summer (Firmin 1890). On the Forests around Crowborough (Done 1914). Near Rifle Butts, Forest Row, Miss P. Stockdale (a specimen in **BEX** is labelled East Grinstead, September 1913 but presumably relates to this site); Ashdown Forest, Miss K. Pickard; near Pound Gate, A. H. Wolley-Dod and A. G. Gregor (Wolley-Dod 1937). Boggy heathland, Ashdown Forest, 1940, D. P. Young (**BM**). Frequent on the Forest (Hall 1980).

Widespread on the boggy, open parts of the Forest but rarely common and often vegetative. It is often found in the wetter boggy pools amongst other vegetation on wet peaty soils. It can be quite difficult to see as the leaves often go reddish and blend in with the *Sphagnum*. As it can become dominant when grazed in bogs elsewhere in Britain, it may have been more widespread formerly than now.

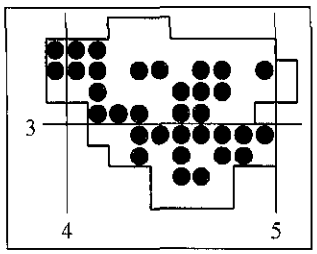
Common in north and western Britain and often dominant on blanket bog vegetation which is either overgrazed or burnt, but less frequent in the south and east. Widespread in Europe but rare in the south. Also in the Arctic regions of North America and Greenland.

***Eriophorum vaginatum*. Hare's-tail cottongrass.**

Ashdown Forest, A. H. Wolley-Dod (Wolley-Dod 1937; no specimen in **BM**). As reported in Rose (1995), it used to occur in several places on the Forest (FR has never seen it on Ashdown Forest). It is likely to have been in wet, open, acidic heathland on peat, possibly with *E. angustifolium*.

Widespread in north and western Britain, with a number of localities on Lower Greensand wet heaths in West Sussex and Surrey and formerly reaching its south-eastern limit at Broadwater and Ashdown Forests, but now extinct in East Sussex. A plant introduced to Hothfield Common in Kent has survived for many years (Philp 1982). Northern, north-east and central Europe.

***Trichophorum cespitosum* subsp. *germanicum (Scirpus caespitosus)*. Deergrass.**

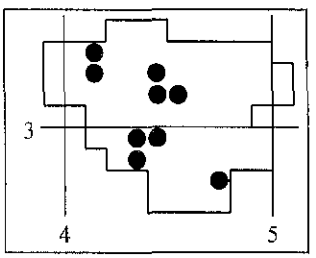


On Ashdown Forest (Coleman 1836). On the Forests, very common, E. Jenner (Arnold 1887). Ashdown Forest near Gills Lap (Done 1914). Ashdown Forest, TWNH (presumably the same record as 1932, G. E. Shaw, **TLS**); near Poundgate, A. G. Gregor (Wolley-Dod 1937). Frequent on the Forest (Hall 1980).

Locally frequent on the Forest, the yellowish tufts standing out in late autumn. It occurs on wet heaths and along the sides of small paths through the heath, usually on damp peaty soils. A good place to see it in abundance is north of Poundgate car park (483,286). This species is often frequent along paths and tracks where soil compaction by trampling results in low aeration of the soil (Rodwell 1991).

Ashdown Forest and the Lower Greensand heaths of West Sussex are its main headquarters in Sussex. It is widespread in northern and western Britain and locally distributed on acidic peaty soils in the south-east. This subspecies occurs in western Europe, whilst subsp. *caespitosus* is more widespread but has not been confirmed in Britain. The species is also recorded in the Himalaya, North America and Greenland.

***Eleocharis palustris*. Common spike-rush.**



Ashdown Forest (Forster 1816). Tetrads 33V, 42N and 43K (Hall 1980).

Very local on the edges of ponds around Kidbrooke, Chelwood Vachery and Pippingford Park and Ridge Road. The few natural populations which have been examined have been subsp. *vulgaris* (e.g. pond on Ridge Road, pond in Mill Wood), and seem to be this uniformly.

Plants in the ornamental pond by Oldlands Hall (476.275), 1995, TR *et al.* have many smaller flowers with glumes 2.7-3.5 mm, and are subsp. *palustris* (confirmed by S. M. Walters); these could have been introduced with other pond plants such as the water lilies but we have not been able to visit the adjacent lakes to see what grows there. This was the first confirmed East Sussex record; a second site at the Tidemills between Newhaven and Seaford has recently been found.

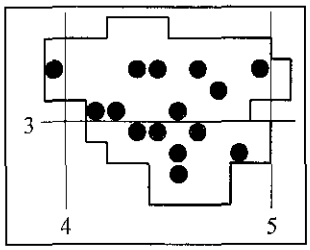
Scattered in Sussex, and widespread in northern temperate regions.

***Eleocharis quinqueflora (Scirpus pauciflorus)*. Few-flowered spike-rush.**

On the Forests, here and there, E. Jenner (Arnold 1887); on a bog on the Forest near Quabrook, between Hartfield and Forest Row, E. Forster (**BM**; Wolley-Dod 1937).

This species of open calcareuous or basic flushing has not been refound and is presumed extinct, Quabrook having been drained many years ago. It is also extinct in Sussex. Locally distributed in Britain, most commonly in Scotland. Found in much of Europe but rare in the south. Also found in temperate Asia, North America and Greenland.

Eleocharis multicaulis. **Many-stalked spike-rush.**

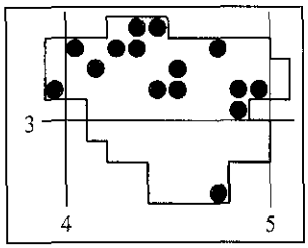


Bogs on Ashdown Forest (Coleman 1836). Ashdown Forest, 1895, T. Hilton (**BTN**). Forest Row and Ashdown Forest, W. Borrer (Wolley-Dod 1937). Near Nutley, 1957, R. A. Boniface (BRC). Tetrads 42J, 42N, 43F and 43M (Hall 1980).

Very local on the wet heathy and peaty parts of Ashdown Forest, usually on soils kept open by trampling or disturbance. It also grows on the edges of the small heathland ponds in Pippingford Park. It is often associated with *Drosera* spp. and *Rhynchospora*.

Locally distributed in Britain, most commonly in western Scotland. A calcifuge of western North Africa and predominantly western Europe.

Scirpus sylvaticus. **Wood clubrush.**

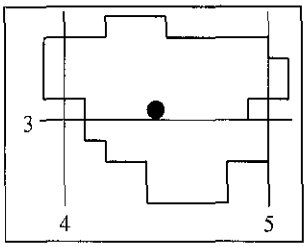


Tetrads 42N, 42T, 43L, 43M and 43R (Hall 1980).

Locally frequent on the north side of the Forest (as found by Hall) usually in damp flushes, ponds and by streams and rivers. It is quite palatable and the flowering heads are often eaten off, presumably by deer.

Scattered in lowland Britain with the main headquarters being the Weald, where it is widespread. Most of Europe but rare in the Mediterranean region.

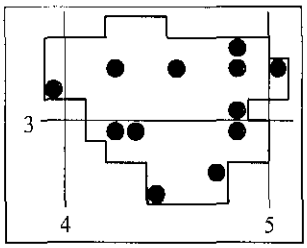
Schoenoplectus lacustris (Scirpus lacustris).* **Common club-rush.



One clump planted in pond in a Pippingford Park (444.303), PW. 1995.

Locally distributed in Sussex but nearly absent from the High Weald. An emergent aquatic of ponds, rivers and lakes throughout Britain and Europe. Widespread in the world.

Isolepis setacea (Scirpus setaceus). **Bristle club-rush.**

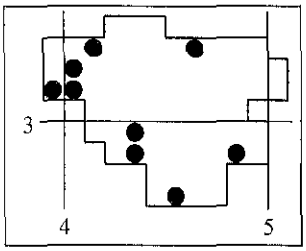


Bogs on Ashdown Forest (Coleman 1836). On the Forests, E. Jenner (Arnold 1887). Ashdown Forest, 1901, T. Hilton (**BTN**; Wolley-Dod 1937). Five tetrads on the Forest (Hall 1980).

Very locally scattered on rides and in open, damp flushes; there may be more around but it is so inconspicuous we would not be surprised if it has been overlooked.

This species is widespread and increasing in Britain (Rich & Woodruff 1990). Most of Europe except the north-east, temperate Asia and North Africa.

Eleogiton fluitans (Scirpus fluitans). **Floating spike-rush.**



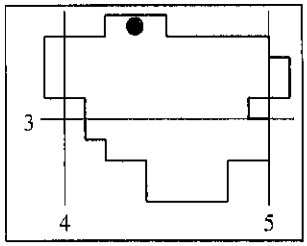
Bogs on Ashdown Forest (Coleman 1836). Pond on the Forest, near Wych Cross (Whitwell 1902). Ashdown Forest near Nutley (Done 1914). Chelwood Common, Miss M. Cobbe (Wolley-Dod 1937). Near Nutley, 1957, R. A. Boniface (BRC). Five tetrads on the Forest (Hall 1980).

It was found in nine 1-km squares during our survey. It is sometimes abundant, as in a small pond near Goat crossroads (401.326), 1995, AK, where many hundreds of plants were present in very shallow water and on wet mud as the water level fell in the summer heat. Similar behaviour was seen in a pond in Kidbrooke Park (418.339), 1995, TR. A patch in the training pond on Pippingford Park (455.310), 1987, SBRS, did not last for long when the Army started training in it!

It is a plant of base-poor water and is rather uncommon nationally, occurring mainly in the north and west and around the New Forest but with a number of sites in Sussex and Surrey. Because of its grass-like appearance it can be easily overlooked but the rather characteristic pale green colour and somewhat limp appearance allow it to be picked out once it is known.

The distribution in Sussex is concentrated around Ashdown Forest and south of Crawley. Widespread in Britain but rare in the south-east. Western and western-central Europe.

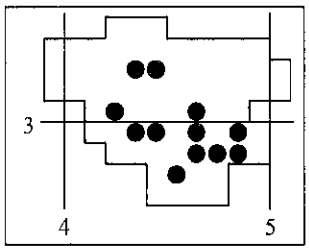
Cyperus longus. **Galingale.**



A couple of plants introduced with other aquatics to a pond on the golf course, Forest Row (436.342) and rather eaten by deer, 14 August 1995, TR. The very next day discovered quite independently by PW, just as a bulldozer was clearing out the pond; it survived, but looked even worse for wear.

As a native this plant is confined to a few marshes and wet pastures near the south and west coasts between Anglesey and Chichester. It is widely available from garden centres and has been introduced to many ponds in southern England (Stewart, Pearman & Preston 1994). It is native in southern, central and western Europe, north to southern England. It also occurs in Asia and North Africa.

Rhynchospora alba. **White beak-sedge.**



Ashdown Forest, 1805, E. Forster (Wolley-Dod 1937). On all the bogs of Ashdown Forest (Forster 1816). On the great bogs of Ashdown (Cooper 1835). Forest Bogs on Ashdown Forest (Coleman 1836). Near Maresfield, 1852, W. C. Unwin (Wolley-Dod 1937). Near Forest Row (Deakin 1871). Ashdown Forest, W. Borrer (Arnold 1887). Ashdown Forest near Nutley, July 1889, Nutley, Dr Trentler (**BTN**). Ashdown Forest, 1901, T. Hilton (**BTN**). Ashdown Forest (Whitwell 1902). Bog on Ashdown Forest near Lutby (Done 1914). Ashdown Forest, 1932, L. M. Child (**TLS**). Bog near Duddleswell Toll Gate, E. Jenner; near Forest Row, E. Jenner; Chuck Hatch, rare, Miss K. Pickard; Ashdown Forest, A. H. Wolley-Dod (Wolley-Dod 1937). Frequent in bogs at Kidbrooke and east of Broadstone Warren, 1948, and near Nutley, 1957, R. A. Boniface (BRC). South of Chuck Hatch, 1950s, FR. Frequent on the Forest (Hall 1980), the only East Sussex sites.

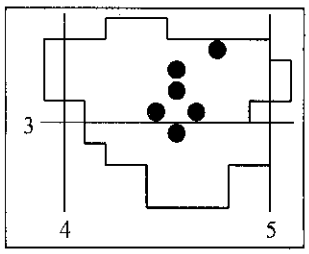
Very restricted and localised on the centre of the Forest, usually in wet, acid peaty places where the peat is lightly disturbed. It often grows with *Drosera* spp. and *Eleocharis multicaulis*. The sites are as follows: hundreds of plants on trampled ride east of Isle of Thorns (423.303), 1993, AK; ride north-east of Millbrook Farm (438.292), 1994, PW; Millbrook (442.293), 1993, AFRR; flushes north-east of Ashdown Forest Centre (439.329, 441.327, 441.325, 443.328), 1993-1995, NM, AK, PW, etc.; Misbourne, two patches in valley bog at 451.275, and at 455.278 and 457.274, 1993+, PW, NM *et al.*; west of Ellison's Pond (461.289), 1986, PW; small patch in bog and odd ones near pond east of Old Lodge (468.298) and to north (465.301, 468.304), 1988-1993+, PW; north of Poundgate (478.288 to 480.287), 1993, AFRR; boggy area by ride south of New Pond Cottages (481.293), 1995, RN & ER. Also seen at 422.307, 443.332, 439.291 and 449.289, 1990-1991, FR.

Very rare in West Sussex on the Lower Greensand but common in the New Forest and at Woolmer in Hampshire. Locally distributed in Britain, most common in western Scotland. Most of Europe except the Mediterranean region and the south-east, and found in North America.

Carex. **Sedges.**

Full details of this large genus can be found in the BSBI Sedge handbook (Jermy *et al.* 1982).

Carex paniculata. **Greater tussock-sedge.**

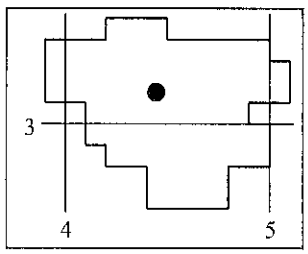


In some of the bogs on Ashdown Forest (Coleman 1836). Plentiful in a bog south of Coleman's Hatch (Done 1914). Ashdown Forest, Miss K. Pickard (Wolley-Dod 1937). Tetrads 42N, 43L, 43M and 43R (Hall 1980).

Most frequent in the Newbridge-Pippingford area, and a few plants near Old Lodge and in the wet woodlands by Pooh Bridge. The extensive stands at Newbridge Bog in the alder coppice grow in a thick iron 'soup'. Where the coppice is very dense the plants can no longer stand the shade, stop flowering and produce few and fewer leaves until the tussocks die; the dead tussocks remain under the alders for some years like little gravestones. However, after coppicing of the alders in 1994, seed germinated in abundance in the open areas, and plants flowered from their second year. The development of the inflorescence at Newbridge is very variable; inflorescences may be dense or lax in the open and sparse in shade, branched or simple, usually without but sometimes with bracts, and the fruits can be broad or quite narrow.

Very locally frequent in Sussex in the Weald. Widespread in lowland Britain often in peaty, medium-rich, seasonally wet soils. Fairly widespread in Europe, Caucasus and western North Africa.

Carex* × *boenninghausiana (C. paniculata* × *remota).



Newbridge Bog, P. C. Hall (Hall 1980). Searched for in 1994 and not found but as many of the big *Carex* tussocks were not flowering in the woodland due to dense shade it would have been very difficult to spot; it could still survive.

One large plant was found in amongst *C. remota* in an alder flush in Pippingford Park just south-east of the Centre Bridge (451.316), 1995, SBRS/Kent Field Club meeting, although there was no *C. paniculata* anywhere near (confirmed A. O. Chater); the plant looks like *C. paniculata* but has narrower leaves and long bracts.

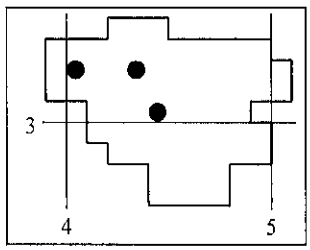
A hybrid first described by Coleman (1849). Scattered throughout Britain where the parents meet but not common, and quite rare in Sussex. Frequent in Europe.

***Carex* × *ludibunda* (*C. paniculata* × *curta*).**

A single tuft was found at Newbridge Bog by FR and J. R. Wallis in 1944 and was tentatively identified by E. Nelmes but the specimen was lost (Hall 1980); the herbarium specimen has recently been refound and confirmed by A. O. Chater (Rose 1995). It was searched for at Newbridge in 1994 and 1995, but was not refound.

A rare hybrid recorded in East Sussex and Wales.

***Carex otrubae*. False fox-sedge.**

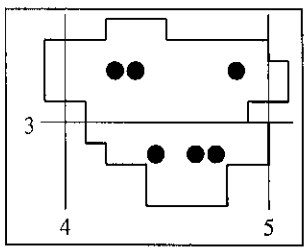


Tetrad 43M (Hall 1980).

One plant on southern edge of dryish grassland area, Goat cross-roads (403.326), 1994, TR; possibly planted by new pond, Pippingford Park (44.30), 1993, SBRS; pond at Ashdown Park (431.320), 1995, TR & PA.

It occurs on the sides of ditches, ponds and streams, on damp and seasonally inundated clayey soils. In Sussex it is noticeably most frequent on the Weald Clay. It is widespread in lowland Britain, common in the south but restricted to the coast in the north. Widespread in Europe except the north, and in Asia.

***Carex spicata*. Spiked sedge.**

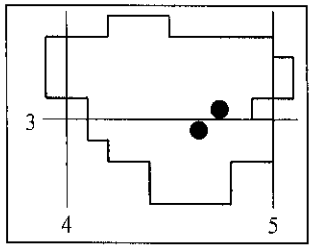


Tetrad 42T (Hall 1980).

A few plants scattered along Ridge Road between the Forest Centre and Wych Cross (42.32, 43.32), 1993, TR & EL; A22 verge at Millbrook bottom (442.286), a very dangerous site due to traffic, 1995, TR; Duddleswell (46.28), 1993, PD; near Radio Station (47.28), 1994, Flora meeting; one plant by main track in Five Hundred Acre Wood (489.326), 1995, PW.

Locally distributed on road verges and in grassland in Sussex and lowland Britain, often on heavier soils than other members of the *C. muricata* group. It is increasing in England (Rich & Woodruff 1996). Widespread in Europe except the north and around the Mediterranean, western Asia and North Africa.

***Carex muricata* subsp. *lamprocarpa*. Prickly sedge.**

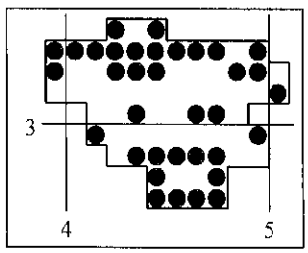


Six plants on dry, trampled grassy verge by lay-by just south of King's Standing (473.301), 1995, PW (confirmed A. O. Chater), where fruit and flower production seems very low; near Camp Hill (46.29), 1995, RN. The pH on the verge at King's Standing was pH 7.0, surprisingly high for a reputed calcifuge.

The plants look like a small *C. spicata,* but have rounded short ligules instead of longer V-shaped ones.

It typically occurs on banks and heaths on open situations, and is much more frequent on the Lower Greensand soils in the Weald than in our area. It is widespread but rarely common in Britain, and mainly occurs in south and west Europe. It is also found in western Asia and North Africa

***Carex divulsa* subsp. *divulsa*. Grey sedge.**

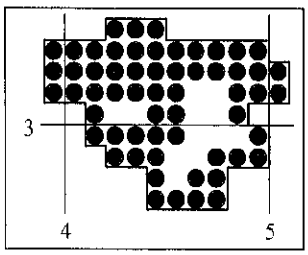


Five tetrads on the Forest (Hall 1980).

Frequent around the Forest, usually on verges and road banks, more rarely in meadows. It can be locally abundant, as on the verge outside Boringwheel Mill (456.263), pH 7.4 or along Ridge Road (42.32), 1995, TR. One plant near Chuck Hatch had an inflorescence 180 cm tall in 1993, PD. No plants of subsp. *leersii* have been found.

It is widespread on a range of soils in warm open situations in Sussex and Britain, and may be increasing in England (Rich & Woodruff 1996). It is quite widespread in Europe, Asia and North Africa.

***Carex remota*. Remote sedge.**

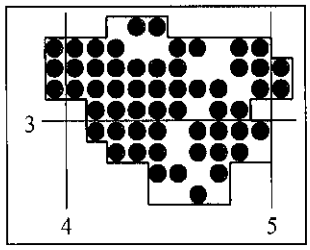


Common on the Forest (Hall 1980).

Locally frequent in wet, soggy places around the Forest, usually where it is shaded, and down the sides of streams. One of our commonest sedges.

Widespread in Sussex and locally common in Britain especially in the west. Widespread in Europe and north-west Africa.

Carex ovalis. **Oval sedge.**

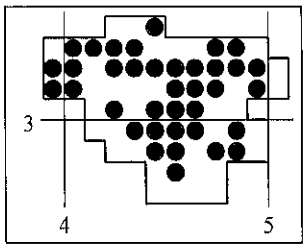


Frequent on the Forest (Hall 1980).

Locally frequent in grassland and by car parks, often where it is slightly open and disturbed. It occurs on poorly drained, seasonally wet, generally acidic soils.

It is frequent on the Tunbridge Wells Sands in Sussex and rarer elsewhere in unimproved situations. Widespread in Britain and Europe. Also found in temperate Asia and the North African mountains.

Carex echinata (C. stellulata). **Star sedge.**

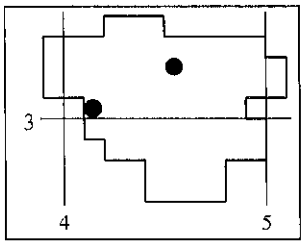


Ashdown Forest, E. Jenner (Arnold 1887). Frequent on the Forest (Hall 1980).

Locally distributed on wet, acidic soils and in *Sphagnum* bogs, often where it is slightly disturbed and open, rarely in abundance. Frequent in the coppice area at Newbridge after clearance, presumably reappearing from buried seed.

Local on bogs and heaths in Sussex, and probably most frequent in Ashdown Forest. Locally abundant in northern and western Britain but uncommon in the south-east. Widespread in much of Europe, temperate Asia, North Africa and North America.

Carex curta (C. canescens). **White sedge.**

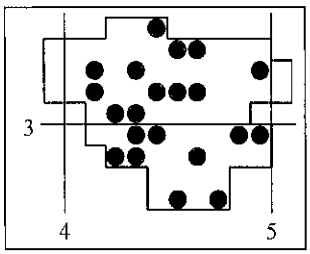


Newbridge, Miss K. Pickard (Wolley-Dod 1937). Tetrad 43L (Hall 1980).

Not seen for many years at Newbridge as most of the alder woodland had grown very dense and shaded but in 1995, about 18 months after an area of alder had been coppiced, there were about 50-100 plants in the south-west corner of the clearing, growing intimately mixed with *C. paniculata* and *C. echinata* in wet, iron-stained swamp (458.323), TR & PW; flush at Isle of Thorns (419.303), 1995, TR & PA. The plants are slightly greyish in colour and erect, and seem to flower and fruit early with ripe fruits dropping at the end of June; they then become very inconspicuous.

In Sussex very local on wet boggy and sandy heaths. Locally frequent in northern and western Britain but very uncommon and restricted to heaths in the south-east. Widespread in Europe except the south, and found in Asia, and North and South America.

Carex hirta. **Hairy sedge.**

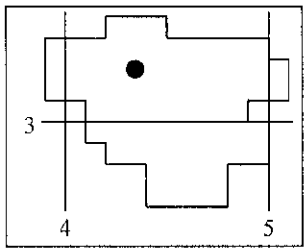


Five tetrads around the Forest (Hall 1980).

Scattered around on road verges and pastures, but not common. It often grows on disturbed places on clayey soils, as for instance along the verges between Nutley and Chelwood Gate (437.284), pH 6.3-6.4. The creeping rhizomes and hairy leaves, or at least hairy sheaths, distinguish this species from other sedges on the Forest.

Locally frequent throughout Sussex, often in damp or water-logged places. Widespread in lowland Britain; Europe except the north, and North Africa.

Carex acutiformis. **Lesser pond-sedge.**

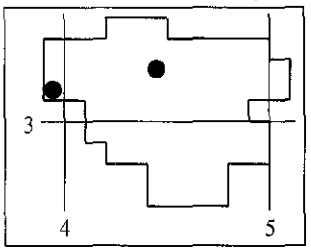


Abundant on north side of lake at Ashdown Park Hotel (431.320), 1995, TR & PA.

Locally frequent in Sussex in standing water along river and stream sides and in ditches and ponds. It occurs on moderately nutrient-rich, circumneutral substrates on the margins of slow-moving and standing lowland waters and wet hollows in flood meadows. The water level may be up to about 20 cm above the substrate.

It is widespread in lowland Britain and more widespread than the following species which grows in similar places to it. Widespread in Europe, temperate Asia and North Africa.

***Carex riparia*. Greater pond-sedge.**



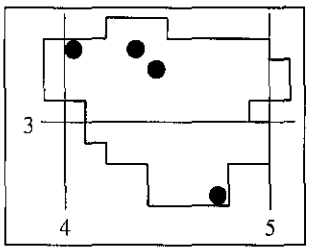
Stream side, Twyford (398.313), 1994, DB; one big patch at the east end of the main pond on Ridge Road (448.329), 1994, PW.

The big fat heads are very distinctive and instantly separate it from *C. acutiformis*.

It is locally frequent in Sussex, the spreading rhizomes often forming extensive stands. It occurs in shallow water or sometimes on drier land, often in nutrient-rich conditions, and tolerates fluctuating water levels.

It is widespread in lowland south-east England, but is rare and usually coastal elsewhere. Widespread in Europe, western Asia and North Africa.

***Carex pseudocyperus*. Cyperus sedge.**



Tetrads 33A and 42T (Hall 1980).

Winter-wet pond by Coldharbour Manor (400.326), 1993, TR (possibly Hall's tetrad 33A record?); pond, Broadstone Farm (43.33), 1987, PD; pond by Ridge Road (447.328), 1993, TR & NM; pond in Furnace Wood (477.260), 1995, TR, probably the 42T record. In all three cases it occurs on clayey soils in semi-shaded, seasonally water-logged or wet conditions.

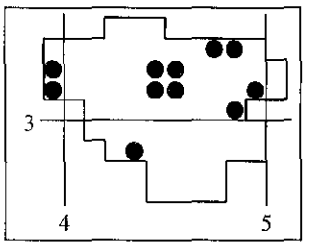
In Sussex it seems most frequent on the Tunbridge Wells Sandstones and on clays, but does occur elsewhere. It occurs quite widely in a range of water and substrate conditions in southern lowland Britain where it is locally frequent. Fairly widespread in Europe, temperate Asia, North Africa and North America.

***Carex rostrata*. Bottle sedge.**

Newbridge, Miss K. Pickard (Wolley-Dod 1937). Not refound and possibly an error for *C. vesicaria* which still grows at Newbridge, though it could have occurred there. It always occurs in wet, peaty bogs or swamps.

It is widespread in northern and western Britain and uncommon in the south-east. Mainly in northern Europe, Asia and North America.

***Carex vesicaria*. Bladder-sedge.**

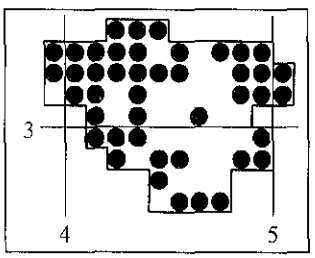


Tetrad 43W (Hall 1980).

Very local in wet woodlands at Horncastle, Pippingford Park, Newbridge, Chuck Hatch, etc., possibly in the more base-rich flushes and mainly on inorganic soils.

Locally distributed in Sussex. Scattered throughout Britain but decreasing in England (Rich & Woodruff 1996). Widespread in Europe, temperate Asia and North America.

***Carex pendula*. Pendulous sedge.**

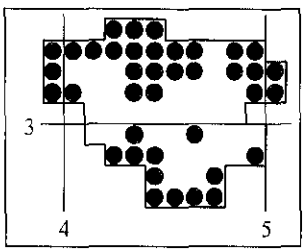


Common on the Forest (Hall 1980).

Widespread around the Forest edges, where it occurs in damp, clayey flushes in woodland and by ponds. It is also grown in gardens and occasionally escapes.

Widespread in the Weald, especially on clays and weakly acidic soils which are seasonally wet. It is widespread in lowland southern Britain and rarer elsewhere. Western, central and southern Europe north to Scotland. Also in North Africa.

***Carex sylvatica*. Wood-sedge.**



Frequent on the west and east sides of the Forest (Hall 1980).

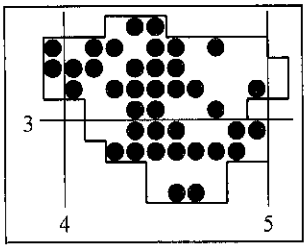
Locally frequent around the Forest edges and in Broadstone Warren. It is most frequent on the more clayey soils, and often occurs on banks where it is not covered in leaf litter.

Common and widespread in Sussex and Britain. Widespread in Europe, temperate Asia and North Africa.

Carex strigosa. **Thin-spiked wood-sedge.**
Tetrad 43W (Hall 1980), not refound and there are no obvious sites for it in the relevant tetrad. In Sussex this often occurs on the Gault Clay or Weald Clay and is easily overlooked as deer eat the spikes (FR).

Locally frequent in southern Britain, the Weald being a major stronghold where it often occurs along the sides of streams in the ravine woodlands. West, central and southern Europe to the Caucasus.

Carex flacca. **Glaucous sedge.**

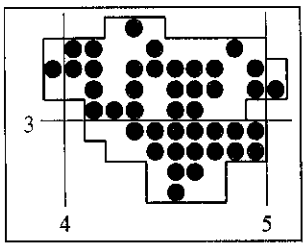


Frequent on the Forest (Hall 1980).

Locally frequent on roadsides around the Forest, especially where the soils are more calcareous. In woodland it flowers sparsely or not at all, and may be relict from more open conditions.

One of the commonest sedges in Sussex, usually on chalk or base-rich clay soils. Widespread in Britain, and in Europe (except the north-east) and North Africa.

Carex panicea. **Carnation sedge, Carnation grass, Pink-leaved sedge.**

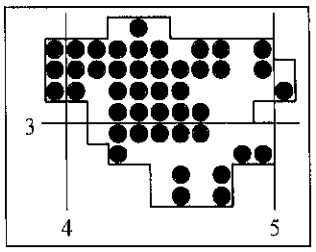


Bogs around Crowborough, etc. (Done 1914). Frequent on the Forest (Hall 1980).

Locally abundant in wet acidic flushes on the Forest, where it is the most conspicuous greyish-leaved sedge. It is often confused with *C. flacca* by the unwary.

Ashdown Forest appears to be its main stronghold in Sussex. It is widespread but decreasing in England (Rich & Woodruff 1996), and is common in northern and western Britain. Widespread in Europe except around the Mediterranean, temperate Asia and North Africa.

Carex laevigata. **Smooth-stalked sedge.**

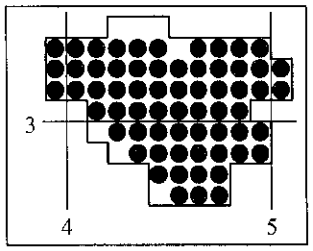


Occasional on the Forest (Hall 1980).

Locally frequent in wet flushes in woodland around the Forest, for instance down the Kidbrooke Stream or in Pippingford Park, and quite widespread. The best place to look for it is in a flush sloping down to the stream side in damp, boggy, shaded conditions.

Locally frequent on acidic soils in the High Weald often near *Chrysosplenium oppositifolium*. Locally frequent in Britain in areas with rainfall above 75 cm a year, but absent from large areas. Endemic to western Europe?

Carex binervis. **Green-ribbed sedge.**

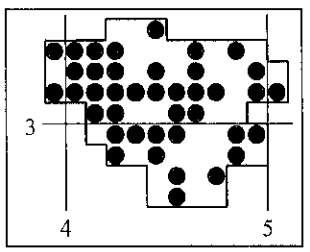


On the Forests, abundant, E. Jenner (Arnold 1887). Ashdown Forest, 1896, T. Hilton (**BTN**). Near Pippingford, 1904, J. Stirling (**TLS**). Common on the Forest (Hall 1980).

One of the commonest robust, tufted sedges on rides and heathy areas, and quite distinctive. It is probably more abundant on Ashdown Forest than anywhere else in Sussex (Rose 1995).

Locally abundant in northern and western Britain and in the uplands, uncommon in the south-east on acidic soils; western Europe and north-west Africa.

Carex viridula (C. demissa **agg.).** **Yellow-sedge.**



This treatment follows the revision of Schmid (1983).

All our recent finds have been subsp. *oedocarpa* (*C. demissa, C. flava* agg.) for which there are old records: Ashdown Forest, E. Jenner (Arnold 1887). Pippingford bog, 1904, J. Stirling (**TLS**). Occasional on the west side of the Forest (Hall 1980).

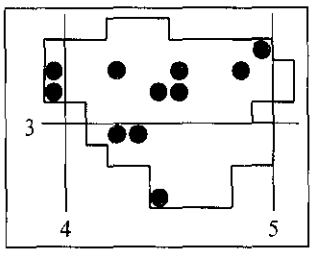
This taxon is occasional in ruts and on tracks and in wet, boggy areas with some base influence on mineral soil. For instance it is locally abundant on the A22 verges at the bottom of Millbrook Hill. It is locally distributed in the Weald and is widespread in Britain; north, west and central Europe and North America.

There is an old record for subsp. *brachyrrhyncha (C. lepidocarpa)* from boggy places on the Forest near Crowborough, J. H. A. Jenner (Wolley-Dod 1937) but this requires confirmation as it is a very rare plant in Sussex, and is usually more associated with basic flushes and fens.

Similarly records for subsp. *viridula (C. serotina)* from Ashdown Forest, E. Jenner (Arnold 1887) and Chelwood Gate, 1955, R. Boniface (Hall 1980) require verification (there is no material in Boniface's herbarium at **NMW**).

Material which initially looked like this subspecies has been collected from Chelwood Gate by TR and several other sites but is subsp. *oedocarpa* (det. A. O. Chater).

***Carex pallescens*. Pale sedge.**

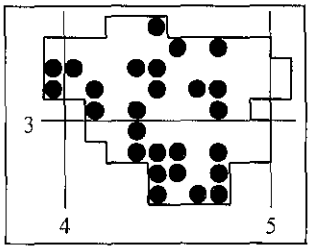


Forest near Wych Cross (Whitwell 1902). Near Coleman's Hatch, C. E. Salmon; Ashdown Forest, Miss K. Pickard (Wolley-Dod 1937). Tetrads 42T and 43R (Hall 1980).

Scattered around the Forest usually in only small quantity, though locally frequent in Pippingford Park. It occurs in open woodland and on tracks.

Occasional on the clays in the Weald. Locally frequent throughout Britain, and quite widespread in Europe. Also in temperate Asia and North America.

***Carex caryophyllea*. Spring sedge.**



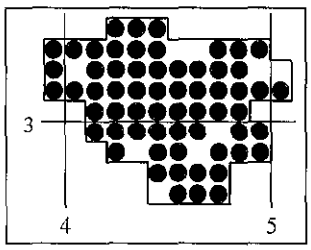
Tetrads 43A, 43K, 43M and 43W (Hall 1980), and another four tetrads added in Briggs (1990).

We have recorded it quite widely and our map shows a distribution strongly related to roads. It usually occurs in short, dry grassland on road verges, in churchyards and on lawns, on weakly to strongly calcareous soils (pH 5.6-7.4 has been recorded in our sites). It is probably under-recorded, overlooked perhaps because it flowers in late spring. It is sometimes only 5 cm high, usually amongst grass that is growing strongly at the time, and fruit set is often the victim of the first mowers of spring.

It is similar in size to *C. pilulifera* with short, stiff stems, a sheathing lower bract and club-shaped male spikes. Vegetatively it creeps through the turf and the laxly tufted or isolated rosettes have dark green shiny leaves with black lines on the underside. *C. pilulifera* has curved, wiry stems and is densely tufted.

Widespread but probably still under-recorded in Sussex despite the extra records in Briggs (1990), many of which were from churchyards. It is commonest in short chalk turf. Widespread and decreasing in Britain (Rich & Woodruff 1996). Widespread in Europe.

***Carex pilulifera*. Pill sedge.**

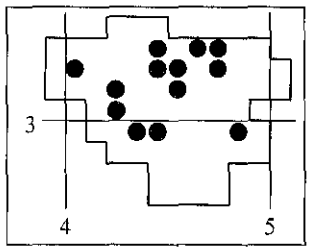


Common on Ashdown Forest (Done 1914). Occasional across the Forest (Hall 1980).

Widespread on the Forest on tracks, in open secondary woodland, on heathland, in acidic grassland and sometimes in disturbed soils, and probably one of the commonest sedges. It is one of the first sedges to flower, usually from March onwards. The leaves and shoots tend to grow sideways rather than erect, and later in the season they look like discarded mop heads.

Frequent on acidic soils in Sussex and Britain. Decreasing in England (Rich & Woodruff 1996). Endemic to Europe east to Leningrad and the Carpathians.

***Carex nigra (C. goodenowii)*. Common sedge.**

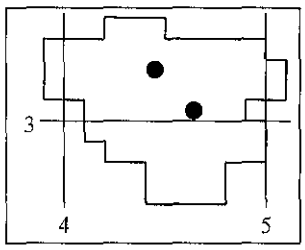


Newbridge, Miss K. Pickard (Wolley-Dod 1937). Occasional on the Forest (Hall 1980).

Scattered in wet flushes, ditches and sometimes drier acidic grassland. Plants may be tufted or rhizomatous and quite variable in appearance, even when growing next door to each other as in the ponds adjacent to Ridge Road.

Occasional in the Weald, and widespread in Britain. Decreasing in England (Rich & Woodruff 1996). Widespread in Europe but rare in the south, Asia, North Africa and North America.

***Carex pulicaris*. Flea sedge.**



Ashdown Forest, E. Jenner (Arnold 1887). South of Chuck Hatch, 1950s, FR. Near Nutley, 1957, R. A. Boniface (BRC). Tetrad 43L (Hall 1980). Near Bowling Green north at Coleman's Hatch (447.328), 1986, R. Tallack, destroyed by a fire lit by Conservation Volunteers, and on ride south of Stonehill car park near *Anagallis tenella* (45.28). Flush north-east of Forest Centre (442.331), 1983, AFRR.

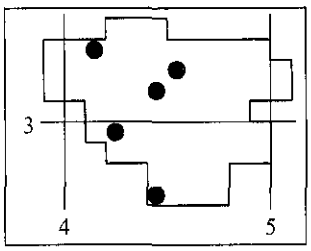
Bog pool east of Old Lodge (466.301), 1990, CM & NM, our only recent record.

A rare plant in Sussex in flushed grasslands. Locally common in northern and western Britain, but now very uncommon in the south-east. Endemic to north, central and western Europe.

POACEAE

The best general identification guide to grasses is Hubbard (1984), though see Stace (1991) for bamboos and updated taxonomy and nomenclature.

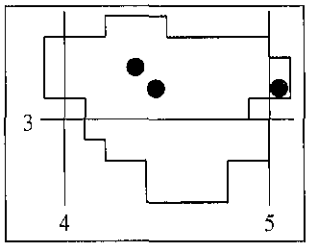
Sasa palmata. **Broad-leaved bamboo.**



Large stands are established in a number of places such as near the stream in Pippingford Park (449.316), 1995, Flora meeting, and near Newbridge splash (455.327). A stand around the east end of the pond at Priory Road (413.339) was cleared in 1995, AK, but has survived.

This bamboo has stems to 2-3 metres tall with broad leaves 3.5-9 cm wide. It is occasionally established in Britain, usually near gardens. It is native in Japan.

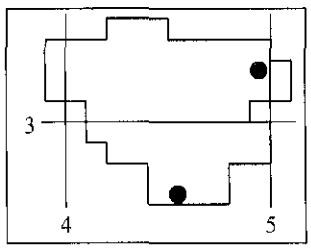
Sasaella ramosa. **Hairy bamboo.**



Car park, Forest Centre (43.32), 1993, TR & NM; small patch on bank by track near Centre Bridge (448.316), 1995, Flora meeting; an unvariegated bamboo at St John's (505.315), 1995, PW, may also be a form of this usually variegated species (det. D. McClintock).

This is a little bamboo growing up to 1.5 metres tall. It is occasionally established in Britain and is native in Japan.

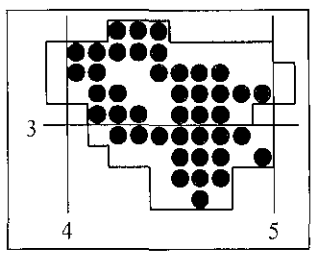
Pseudosasa japonica. **Arrow bamboo.**



Near Forest Lodge (452.263), 1995, AK; Marden's Hill (499.325), 1987-8, PW & RW (det D. McClintock).

It grows to 5 metres tall and has narrow leaves up to 4 cm wide. The commonest species established in Britain, usually near gardens. It is native in Japan and Korea.

Nardus stricta. **Mat-grass.**

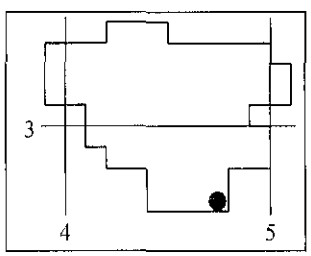


Ashdown Forest, 1833, J. Woods (Wolley-Dod 1937). Ashdown Forest (Coleman 1836). Ashdown Forest, E. Jenner (Arnold 1887). Very plentiful on Ashdown Forest (Done 1914). Frequent on the Forest (Hall 1980).

A tough grass, unpalatable to stock and dominant over large areas of acidic grassland elsewhere in Britain. On Ashdown Forest it is largely restricted to rides where it tolerates mowing, but must have been more widespread when the Forest was extensively grazed. The patches of dark green tussocks with the black flowering heads and the previous year's dead white leaves are distinctive. Ashdown Forest is its main locality in Sussex and probably the only area where it is still frequent.

Decreasing in lowland England (Rich & Woodruff 1996), but still common and widespread in the north and west of Britain. Widespread in Europe, but only in the mountains in the south; temperate Asia, North Africa and eastern North America.

Milium effusum. **Wood millet.**

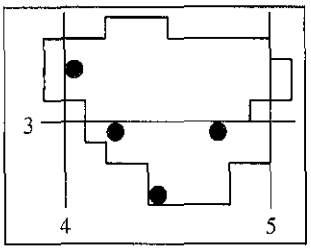


Wood near Wood's Nursery, Maresfield, A. H. Wolley-Dod (Wolley-Dod 1937). Tetrad 42T (Hall 1980).

Locally abundant by Forest Pale at Fairwarp (473.266), and a few plants by shaded stream, Furnace Wood (474.264), 1993, TR & SR in the same area as the previous records. This species likes the richer, moist brown soils in the Weald, and is surely not found mainly on calcareous soils as sometimes suggested.

Scattered through woodlands in Sussex and fairly widespread in lowland Britain, especially in the south-east. Widespread in Europe, temperate Asia and North America.

***Festuca pratensis*. Meadow fescue.**

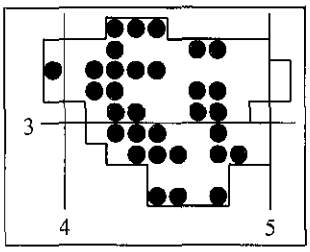


Five tetrads around the south side of the Forest (Hall 1980).

Goat crossroads area (40.32), 1993, AK; meadow at Braberry Hatch (427.297), 1994, TR & DK; Hunters Farm area (44.26), 1994, TR; near Radio Station, presumably from verge (47.29), 1994, SBRS.

Scattered in grassy places, usually in older pastures on damp soils, in Sussex and lowland Britain. Widespread in Europe and south-west Asia.

***Festuca arundinacea*. Tall fescue.**

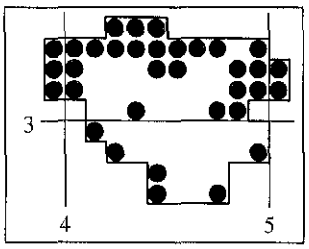


Four tetrads on the Forest (Hall 1980).

Characteristic of the sides of roads where it forms small patches, and most noticeable before the verges are cut. The increase in winter road salting may explain the increase in the amount of this grass since Hall (1980) as it seems quite tolerant of salt and is becoming fairly characteristic of roadsides in Britain. It also lines the edges of some French motorways.

Scattered in damp grassy places in Sussex, and sometimes planted for forage. Widespread in lowland Britain, and in Europe, North Africa and Asia.

***Festuca gigantea*. Giant fescue.**

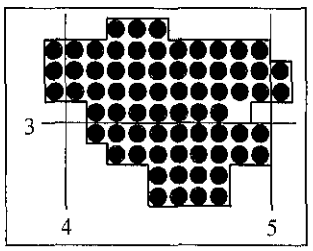


Frequent on the Forest (Hall 1980).

Damp, shaded or open verges, stream sides and waste ground, mostly around the edges of the Forest. Usually in damp, nutrient-rich places, on the better soils.

Common in the Weald. Increasing in England (Rich & Woodruff 1996) and widespread in lowland Britain. It occurs in most of Europe and temperate Asia.

***Festuca rubra*. Red fescue.**



Common on the Forest (Hall 1980).

Very widespread on the Forest on verges, in car parks, churchyards, sown grass on rides, and in meadows and pastures, but not on acidic heathland. There was one record for a tufted form possibly subsp. *commutata* on sandy ground at Pippingford Park (449.314), 1995, TR, PH *et al.*

Common in Sussex and Britain and increasing in England (Rich & Woodruff 1996). Widespread in Europe.

***Festuca ovina* agg. Sheep's-fescue.**

The *F. ovina* aggregate on the Forest appears to be composed of the two taxa below, and *F. ovina s.s.*, which was recorded frequently on the Forest in Hall (1980), has not been found despite careful searching by TR. Probably all previous *F. ovina s.l.* records can be referred to *F. filiformis*.

***Festuca filiformis (F. tenuifolia).* Fine-leaved sheep's-fescue.**

Ashdown Forest near the Stone Quarry (Coleman 1836). Tetrads 43B and 43G (Hall 1980), though clearly under-recorded as stated above.

F. filiformis is widespread but only locally frequent on rides and tracks through acidic grassland and heathland. It has not been seen in the grazing enclosure at Millbrook, and the impression of the micro-distribution elsewhere is that it is increasing after cessation of the grazing, which would fit with Coleman's observation of only one site. It is distinguished by the tufted, fine leaves which are often bluish-grey, and it has very short awns on the small florets. It flowers quite early and the fruits dehisce and drop in mid summer.

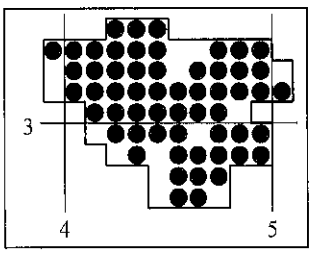
Scattered in lowland Britain on rocky, mineral and peaty soils, and in west and central Europe.

***Festuca lemanii (F. longifolia* in part). Confused fescue.**

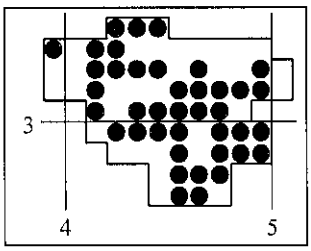
A few clumps on eastern bank of track just north of Half Moon Copse (427.318), 1993, TR & EL. It differs from *F. filiformis* in having generally longer awns and lemmas 4 mm or more long (to 3.5 mm in *F. filiformis*).

Rarely recorded in Sussex where it is thought to be introduced (Hall 1980), and scattered in Britain. Stace (1991) regards it as probably native, and the location of our site might suggest the same. Widespread but mainly western in Europe.

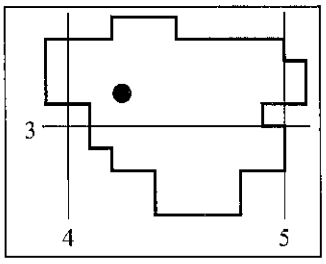
F. ovina agg.



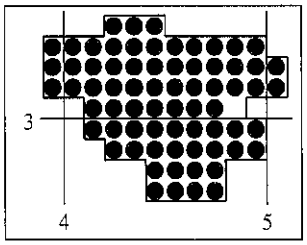
F. filiformis



F. lemanii



Lolium perenne. **Perennial rye-grass.**

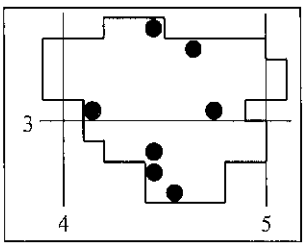


Common on the Forest (Hall 1980).

Recorded widely in meadows, verges, car parks and on tracks in every square except one, where it must occur but we have not had access to the farm land. It is obviously widely sown in pastures.

Ubiquitous in Sussex and much of Britain. Europe, North Africa and Asia.

Lolium multiflorum. **Italian rye-grass.**



Frequent on the Forest (Hall 1980).

We have recorded it scattered around on verges and in meadows, especially new leys.

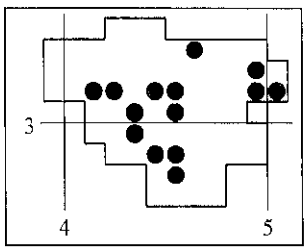
It is widespread in Sussex and lowland Britain, and is widely cultivated. Possibly native in southern Europe.

Lolium temulentum. **Darnel.**

In a cornfield near Duddleswell, E. Jenner (Wolley-Dod 1937).

Not refound, and there are no cornfields at Duddleswell any more. Now a rare casual in Sussex and decreasing generally in England (Rich & Woodruff 1996). Perhaps native around the Mediterranean.

Vulpia bromoides. **Squirrel-tail fescue.**

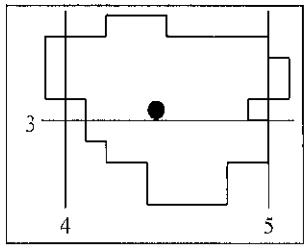


Tetrads 43H and 43L (Hall 1980).

Locally distributed on sandy banks, tracks, car parks, bare ground and heathy areas around the Forest. It is an annual which usually grows on acidic, open soils.

Frequent in Sussex and widespread in lowland Britain, reaching its northern limit in Scotland. South, west and central Europe, and also in the mountains in Africa.

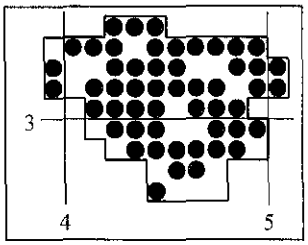
Vulpia myuros. **Rat's-tail fescue.**



Home Farm area (44.30), 1993, TR & PD, probably casual.

Occasional in Sussex and increasing in England (Rich & Woodruff 1996). Scattered in lowland Britain and often associated with railways. Western, southern and central Europe.

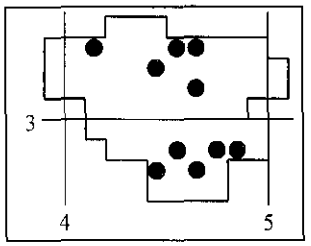
***Cynosurus cristatus*. Crested dog's-tail.**



Frequent in heavily-grazed meadows and pastures, but rare elsewhere. The tough, wiry inflorescences tend to persist in grazed pastures and are visible even through the winter.

Recorded in 90% of the tetrads in Sussex (Hall 1980). Common and widespread in Britain and most of Europe and south-west Asia.

***Briza media*. Quaking-grass.**

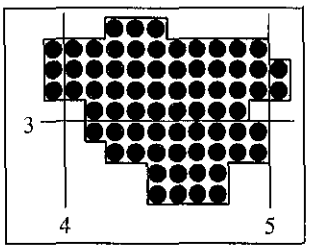


Frequent on the Forest (Hall 1980).

Roadsides, as at Poundgate, Gills Lap, etc., and in churchyards as at Nutley.

Very common on the Downs in Sussex, and sometimes on clays and in churchyards in the Weald. Widespread but decreasing in England (Rich & Woodruff 1996). Widespread in most of Europe and Asia.

***Poa annua*. Annual meadow-grass.**

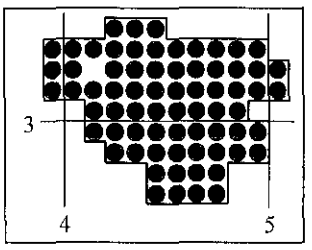


Common on the Forest (Hall 1980).

Recorded in every square in our survey, usually one of the first species to be found after starting recording in car parks. It also occurs on rides, in meadows, in urban areas and on verges.

Ubiquitous in Sussex, Britain and most of the temperate regions of the world.

***Poa trivialis*. Rough meadow-grass.**



Common on the Forest (Hall 1980).

Recorded in every square except one, where it may have been overlooked. It is frequent on disturbed ground, damp woodland especially along stream sides, roadsides and in some pastures. It prefers damp, richer soils and is not found on heathlands.

Widespread and increasing in England (Rich & Woodruff 1996). Throughout Britain and Europe, temperate Asia and North Africa.

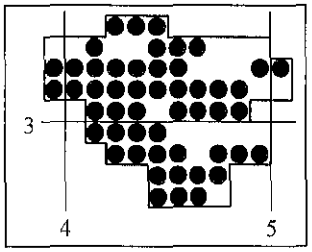
***Poa pratensis* agg. Smooth meadow-grass.**

Common on the Forest (Hall 1980).

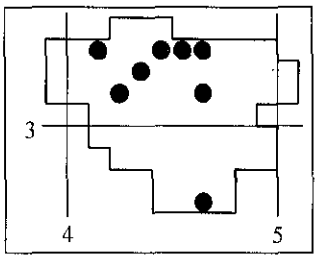
Locally frequent, especially along the edges of road verges. Occasionally recorded on walls and in pastures.

Both segregates *P. pratensis sensu stricto* and *P. subcaerulea* have been recorded. *P. pratensis* is probably widespread as it is in the rest of Sussex, and *P. subcaerulea* seems to be quite frequent too, though under-recorded in Sussex (Hall 1980).

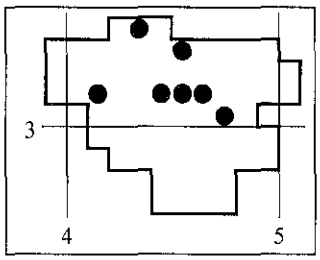
Poa pratensis agg.



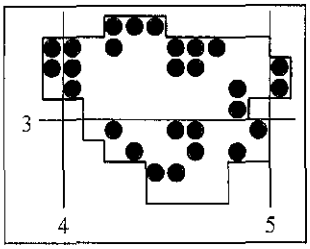
Poa pratensis s.s.



Poa subcaerulea



Poa nemoralis. **Wood meadow-grass.**

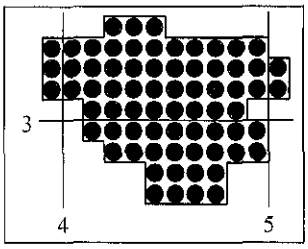


Near Fisher's Gate, rare, A. H. Wolley-Dod (Wolley-Dod 1937). Frequent on the Forest (Hall 1980).

Locally frequent on dry banks and in sunken lanes, especially around the edges of the Forest.

Local in Sussex, but widespread in Britain. Widespread in Europe, Asia and North America.

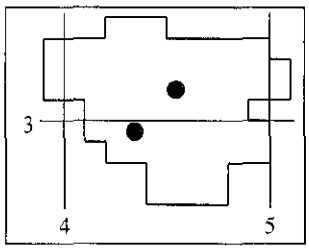
Dactylis glomerata. **Cock's-foot.**



Recorded in every square on the Forest, mainly on verges and waste ground. It is highly palatable and does not persist in heavily grazed pastures.

Ubiquitous in Sussex and lowland Britain. A very variable species which is widespread in Europe, temperate Asia and North Africa.

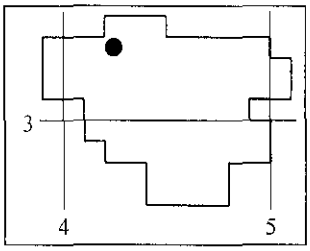
Catapodium rigidum (Desmazeria rigida).* **Fern-grass.



A few plants on a realigned section of the A22 on Millbrook Hill (438.296), 1994, TR; frequent on limestone chippings on a turning circle at Pippingford Park (456.312) and presumably introduced with the chippings, 1995, Flora meeting.

A calcicole locally frequent on the Downs in Sussex, and occasional elsewhere, but generally widespread in lowland south-east England. It occurs in southern and western Europe reaching its northern limit in Scotland; in North Africa and western Asia.

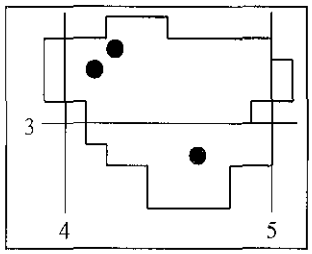
Catapodium marinum (Desmazeria marina).* **Sea fern-grass.



Scattered over 9 metres on the verges of the A22 on open ground by the south-east corner of Kidbrook Park (420.336), pH 7.5, TR, 1994 (no other saline species present). In 1995 the plants had spread an additional 31 metres to the north, and PW found two on the pavement edge about 100 yards further on. Assuming that a similar 4-5-fold increase in population size has occurred each year, the plant arrived some time around 1989/1990.

Scattered along the coast in Sussex on shingle, dunes and cliffs, and our record is the first inland one. West and southern coasts of Europe and North Africa.

Glyceria maxima.* **Reed sweet-grass.



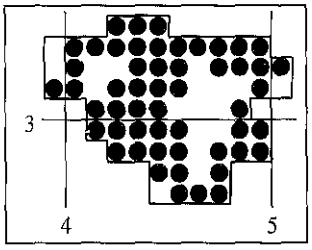
Tetrads 42P and 43Q (Hall 1980).

Variegated plants in pond, Broadstone Warren (415.326), 1995, TR; variegated plants in pond at Tompset's Bank (423.338), 1995, PW; normal plants introduced to Ellison's Pond and forming large stands (462.288), 1993, NM *et al.* Variegated plants are available in some garden centres, but as they grow rapidly they are often dumped in ponds elsewhere.

In Britain it often occurs in nutrient-rich water, especially with high phosphate levels, and on substrates with a high mineral content such as river alluvium. It usually occurs in shallow water and may develop as a floating raft, is rarely found in deep water, and is uncommon in fast-flowing water. The water and soils on the Forest are not really suitable for it. It is also very palatable to stock.

Locally frequent along the larger rivers and in the grazing marshes in Sussex, but not common in the Weald. It occurs on flood-plain fens, river banks, ditches, lake margins and rarely in wet meadows. In the lowlands north to northern England, but very uncommon in Wales and Scotland. Widespread in most of Europe and temperate Asia.

Glyceria fluitans. **Floating sweet-grass.**



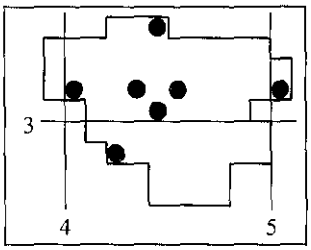
Frequent on the Forest (Hall 1980).

Locally frequent in wet pastures, boggy flushes, ditches and along the margins of small streams in pastures, and also present, sometimes nearly dominant but not flowering, along the sides of streams in alder woodland. It occurs in shallow, seasonally-inundated land on nutrient-rich soils, usually with a fine mineral substrate.

It is more variable than *G. declinata* and *G. notata,* possibly because it is largely out-breeding (Borrill 1958a, b).

Widespread and frequent in the Weald and in Britain. Widespread in Europe, and present in North America.

Glyceria declinata. **Small sweet-grass.**

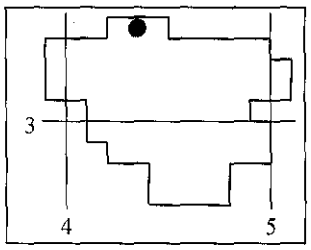


Tetrads 33V, 43F and 53B (Hall 1980).

Very locally distributed in scattered wet sites around the Forest. Borrill (1958a) notes it can persist in trampled turf and occurs on both acidic and base-rich soils. Plants with short grey leaves should be carefully examined to see if the lemma is toothed (do not confuse this with the palea teeth).

Scattered in the Weald and in lowland Britain. Widespread in Europe, and present in North America.

Glyceria notata (G. plicata). **Plicate sweet-grass.**

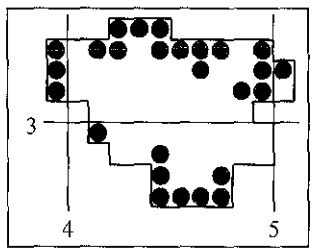


By the stream at Coleman's Hatch (Done 1914). Tetrads 42J, 43A and 43R (Hall 1980).

Wet ditch east of Stonehouse Farm, Forest Row (437.349), 1995, TR & PA, the same area as Done's and Hall's 43R records. The tetrad 42J and 43A records look odd as it does not tolerate acidic soils (Borrill 1958a).

Local in Sussex and widespread in lowland Britain. In Europe, North Africa and western Asia.

Melica uniflora. **Wood melick.**

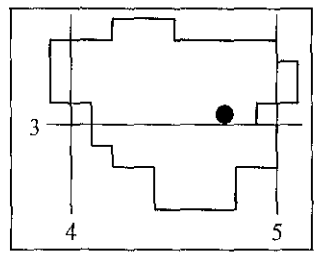


Frequent on the Forest (Hall 1980).

Scattered around the edge of the Forest on woodland banks, sunken lanes, etc., perhaps its most characteristic habitat, often with *Brachypodium sylvaticum*. It also grows on dry banks in woodland.

Frequent in the Weald, and widespread in Britain. Most of Europe and in south-west Asia.

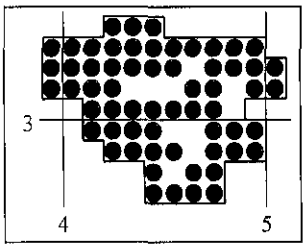
Helictotrichon pubescens (Avenula pubescens). **Downy oat-grass.**



One small patch on calcareous verge with *Bromopsis erecta*, pH 6.7, opposite junction at King's Standing (473.301), 1995, Flora meeting.

Frequent on the Downs and some of the calcareous clays and limestones in the Weald, casual or introduced elsewhere, as presumably is our record. Widespread in Britain especially on calcareous soils, and fairly widespread in Europe and temperate Asia.

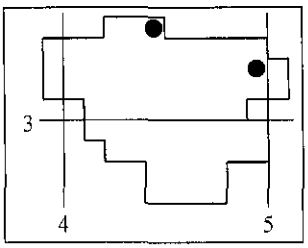
Arrhenatherum elatius. **False oat-grass.**



Frequent and widespread on verges and field edges, sometimes just under hedges, and often dominant where only mown once or twice a year. It is a palatable species and thus must have spread since grazing ceased on the Forest. Both subsp. *elatius* and subsp. *bulbosus* were recorded in 1993-1994 but have not been investigated in detail - the former appears to be much more common.

Recorded in 98% of the tetrads in Sussex (Hall 1980). Increasing in England (Rich & Woodruff 1996), and widespread in Britain, Europe and Western Asia.

****Avena fatua.*** **Wild-oat.**

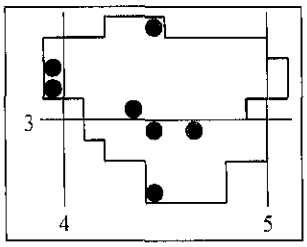


Tetrad 42N (Hall 1980).

Upper Parrock Farm (449.347), 1994, TR; introduced on verge Marden's Hill (499.325), 1993, TR.

A frequent arable weed in Sussex, and increasing in England (Rich & Woodruff 1996). Widespread in Europe, North Africa and Central Asia.

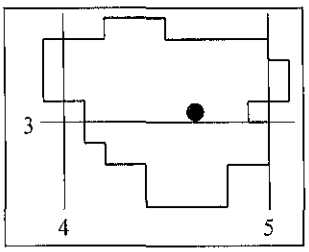
****Avena sativa.*** **Cultivated-oat.**



Scattered on roadsides and rides across the heathland, the latter presumably from horse feed.

Scattered throughout Britain as a relict of cultivation.

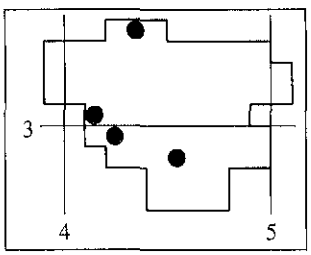
****Gaudinia fragilis.*** **French oat-grass.**



North-east corner of Lodge car park (469.306), about 12 plants, 1993, TR, with more in 1994 and 1995, the first record for East Sussex. It may have been introduced with grass seed when the car park was created in 1983; a number of other alien annuals appeared the following year.

It is well established and persistent elsewhere in southern England in grassland. Native in southern Europe.

Trisetum flavescens. **Yellow oat-grass.**

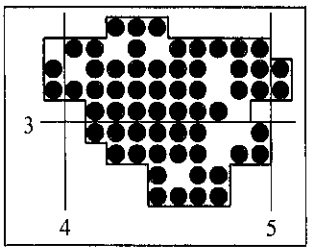


Scattered on the Forest (Hall 1980).

We have similarly recorded it in scattered sites on verges and in meadows.

Widespread on calcareous soils in Sussex and lowland Britain. Widespread in Europe and temperate Asia.

Deschampsia cespitosa. **Tufted hair-grass.**



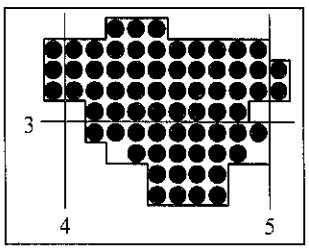
Common on the Forest (Hall 1980).

Locally frequent in clayey pastures, roadsides and damp woodland. It is a very variable species in Britain, both genetically and phenotypically. We have not investigated which of the subspecies occur in our area.

It grows in a wide range of grazing, temperature, light and soil conditions, but does not tolerate intense competition and thus is most abundant in shaded, seasonally water-logged or infertile sites (Davy 1980). It is self-incompatible and a good clump can produce up to half a million seeds a year.

Common in the Weald, again on clayey soils and in woodlands. Widespread in Britain and in Europe though rare in the Mediterranean region, and widespread in temperate regions of the world. The closely related *D. antarctica* is one of two Antarctic flowering plants.

Deschampsia flexuosa. **Wavy hair-grass.**



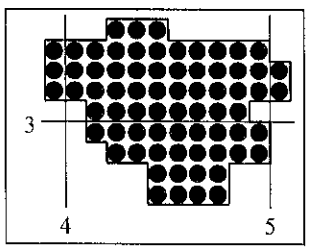
Ashdown Forest, 1893, T. Hilton (**BTN**). Common on the Forest (Hall 1980).

Found widely on the Forest, on rides, in amongst heather and in open areas of bracken and acidic grassland. It is also often found on banks, on the Forest pale and on raised soils around the base of trees in woodland, but usually absent from the flatter areas probably because the leaves are evergreen and cannot tolerate being covered each autumn by deep leaf litter. It was probably very much more common when the Forest was grazed as it is generally unpalatable and it may have been one of the dominant grasses.

Studies at Headley Heath, Surrey by Shaw *et al.* (1995) found that soil eutrophication caused by dog fouling along paths resulted in a change from vegetation dominated by *Calluna* to one dominated by *Deschampsia flexuosa*. Similar patterns can be seen near some of the more popular car parks on the Forest.

Locally common on acidic, nutrient-poor soils in Sussex and widespread in Britain, especially in the north and west. Widespread in Europe except the south and south-east, in northern Asia and the Americas.

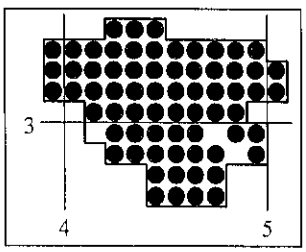
Holcus lanatus. **Yorkshire fog.**



Recorded in every square, on verges, grassland and open woodland. It has a broad ecological tolerance in Britain and tends to occur on the more nutrient-rich soils. It can be a rapid colonist of fire sites.

Recorded in 99% of the tetrads in Sussex (Hall 1980). Widespread in Britain and Europe.

Holcus mollis. **Creeping soft-grass.**



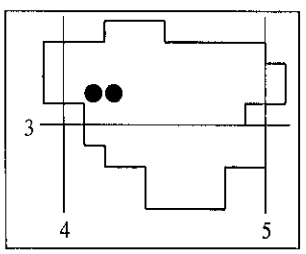
Common on the Forest (Hall 1980).

Locally frequent around the Forest, sometimes on open heaths, more often in woodlands. It forms creeping patches and, in contrast to *D. flexuosa* in woodlands, occurs in places where the leaf litter lies on slightly more nutrient-rich places.

Common on acidic sands in Sussex and occasional elsewhere. Widespread in Britain and most of Europe, and in temperate Asia and North Africa.

Hybrids between the two *Holcus* species have not been found yet on the Forest.

Aira caryophyllea. **Silver hair-grass.**

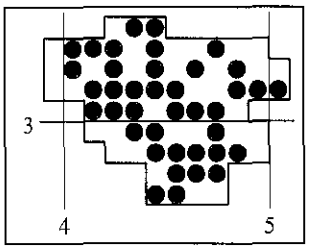


On Ashdown Forest (Coleman 1836). Tetrads 42T, 43K and 43W (Hall 1980).

Recorded only on both western and eastern halves of Wych Cross Reservoir (420.315) on freely drained soils, 1995, TR & Emma Goddard.

Occasional in Sussex, often on dry acidic soils. Decreasing in England (Rich & Woodruff 1996). Scattered but widespread in Britain and in south, west and central Europe, Africa and Asia.

Aira praecox. **Early hair-grass.**

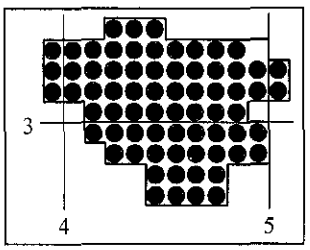


Frequent on the Forest (Hall 1980).

Locally scattered on rides in barer, sandy soils. It is a winter annual of short, open vegetation on generally acidic soils.

Locally frequent in Sussex on sandy heaths and banks. Decreasing in England (Rich & Woodruff 1996). Widespread in Britain and mainly western (possibly endemic?) in Europe.

Anthoxanthum odoratum. **Sweet vernal grass.**



Widespread in acidic grassland and rides around the Forest.

Recorded in 90% of the tetrads in Sussex (Hall 1980). Common in Britain, Europe and temperate Asia.

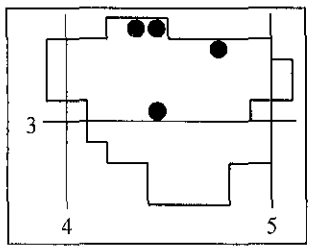
Phalaris arundinacea. **Reed canary-grass.**

Tetrad 43H (Hall 1980).

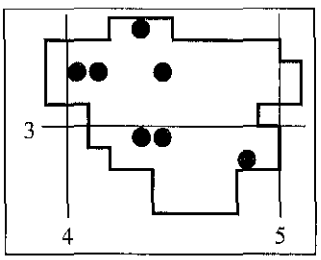
We only have four native squares; along the Medway at Forest Row (43.34 and 44.34), 1994, TR; near Pooh Sticks Bridge (47.33), 1988, PW; and in the lake at Pippingford Park (44.30), 1995, PH and Kent Field Club. All other plants introduced to ponds etc. around the Forest are the garden form with variegated leaves, var. *picta*.

Widespread in Sussex especially on the larger river banks and in marshes. Widespread in lowland Britain. Widespread in Europe except the extreme south, temperate Asia, South Africa and North America.

P. arundinacea var. *arundinacea*



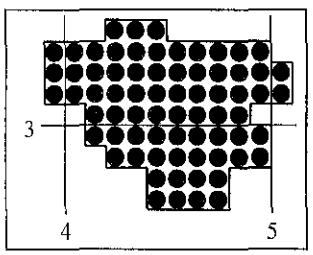
var. *picta*



[*Phalaris canariensis.* **Canary-grass.**

Tetrad 53A (Hall 1980), probably in Crowborough outside our area.]

Agrostis capillaris. **Common bent.**

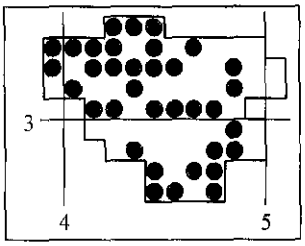


Common on the Forest (Hall 1980).

Common in grassland and on rides. This was probably one of the commonest grasses on the Forest when it was grazed, and it still dominates areas of acidic grassland and the less improved pastures.

Very common in Sussex and either increasing or more widely recorded in England (Rich & Woodruff 1996). Widespread in Britain and Europe.

Agrostis gigantea. **Black bent.**

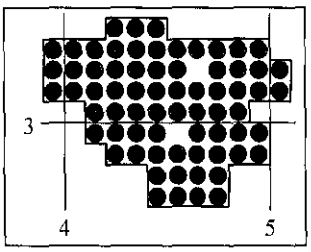


Tetrad 42E (Hall 1980).

Mainly recorded in 1993-1994 from road sides by TR or AK, as robust plants on verges rather than as the arable weed form. Some road verge plants could be *A. castellana*, which is regularly sown on new verges, and need re-checking.

Oddly more frequent in West than East Sussex, presumably related to differences in recording by botanists. Increasing in England (Rich & Woodruff 1996). Widespread in southern Britain and Europe.

Agrostis stolonifera. **Creeping bent.**



Common on richer soils around car parks and on footpaths, but rare on open rides.

This is a very variable species, with many different genotypes adapted to different habitats (Kik *et al* 1990). For instance plants with a few, long, thick stolons occurred in a productive meadow, and plants with short thin stolons occurred in saltmarshes. There were also differences in variation within populations, with least variation present in the meadow as the inflorescences were usually grazed off and reproduction was mainly clonal vegetative spread of a few large clones.

Recorded in 95% of the tetrads in Sussex (Hall 1980). Widespread in Britain and Europe.

[*Agrostis curtisii (A. setacea).* **Bristle bent.**
Noted in error and later corrected by W. H. Coleman (Rich 1994).]

Agrostis canina sensu lato.

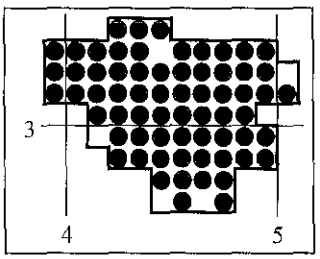
Ashdown Bog, 1939, G. E. Shaw (**TLS**). Frequent on the Forest (Hall 1980).

Represented by both *A. canina sensu stricto*, velvet bent, and *A. vinealis (A. canina* subsp. *montana)*, brown bent, which are mapped separately, though both are under-recorded by comparison with the aggregate. Both are quite widespread in Sussex and Britain.

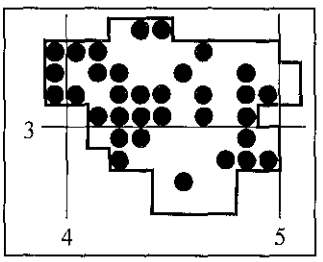
A. canina s.s. occurs most typically in wet flushes and seasonally-inundated ponds, and is distinctive in forming mats of fine, grey leaves. It occurs throughout most of Europe, temperate Asia and north-east America.

A. vinealis is more common in dryer grassland and may have been as abundant as *A. capillaris* when the Forest was grazed. It occurs mainly in north-west and central Europe, and temperate Asia.

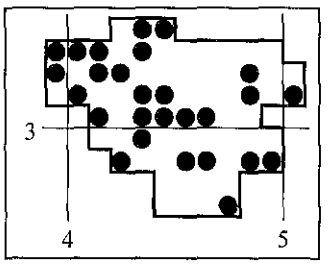
Agrostis canina s.l.



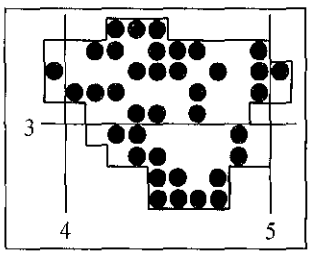
A. canina s.s.



A. vinealis



Alopecurus pratensis. **Meadow foxtail.**

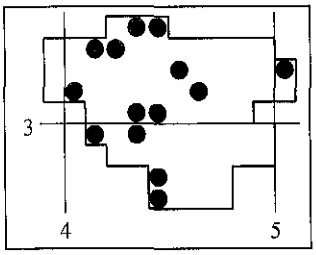


Frequent on the Forest (Hall 1980).

Recorded on roadsides and verges, wet pastures and meadows. A robust grass which is one of the first to flower in the year and is easily overlooked at the end of the season.

Widespread in Sussex and increasing in England (Rich & Woodruff 1996). Widespread in Britain, Europe and North Asia.

***Alopecurus geniculatus*. Marsh foxtail.**



Common on the Forest (Hall 1980).

Scattered in wet flushes and pastures.

Frequent and locally common in Sussex and increasing in England (Rich & Woodruff 1996). Widespread in Britain and Europe except the extreme south. North Asia and North America.

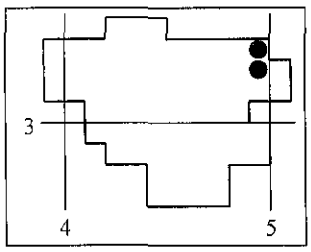
***Alopecurus aequalis*. Orange foxtail.**

Between Wych Cross and East Grinstead, E. Ellman; Ashdown Forest, 1901, T. Hilton (**BTN**; Wolley-Dod 1937).

Probably extinct. This beautiful grass is an annual and numbers can vary enormously from year to year so the absence of records in our survey may not mean that it is truly extinct in the area. Salisbury (1970) gives detailed ecological information.

Nationally it is declining but it is still known from several sites around Crawley and occurs just outside the Flora area on the edges of Weir Wood reservoir. Widespread in Europe, temperate Asia and North Africa.

***Alopecurus myosuroides*. Black-grass.**



Tetrads 42N and 42T (Hall 1980).

Disturbed ground near Marden's Hill (499.325), pH 7.6, 1993, TR; fields near Friar's Gate (499.334), 1987-88, PW.

An annual grass usually of heavy clay soils, and sometimes a pernicious weed. Locally frequent in Sussex and in south-east England. Possibly native in south and west Europe and temperate Asia but widely introduced elsewhere.

***Phleum pratense sensu lato*.**

Now split into two tolerably distinct species (Stace 1991). *P. pratense* is a tall, erect robust species with long heads and large spikelets (4 mm or more longer). *P. bertolonii* is smaller, usually with spikelets up to 3.5 mm long.

***Phleum pratense sensu stricto*. Timothy.**

Recorded in meadows, verges and in car parks, and probably mainly of cultivated origin.

Recorded in 90% of the tetrads in Sussex (Hall 1980). Widespread in Britain and Europe.

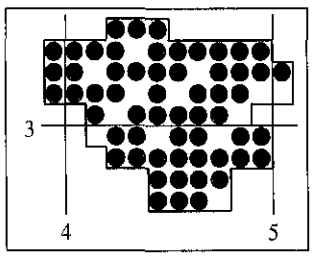
***Phleum bertolonii (P. pratense subsp. bertolonii)*. Smaller cat's-tail.**

Frequent on the Forest (Hall 1980).

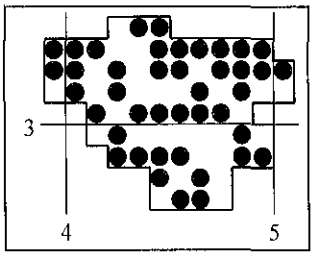
Frequent in short, open grassland and on verges. A number of records in 1993 were probably unnecessarily rejected.

Frequent in Sussex and Britain on a range of soils. Uncommon in northern Europe.

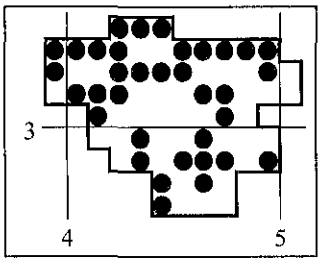
Phleum pratense s.l.



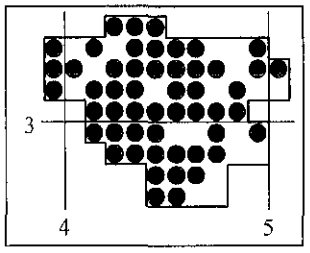
Phleum pratense s.s.



Phleum bertolonii



***Bromus hordeaceus*. Soft-brome.**



Common on the Forest (Hall 1980).

Scattered on verges and in open pastures.

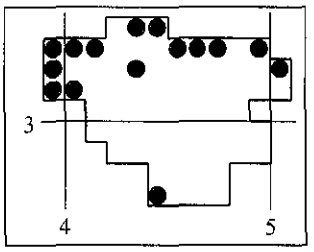
Very common in Sussex and increasing in England (Rich & Woodruff 1996). Widespread in Britain and Europe and western Asia.

***Bromus lepidus*. Slender soft-brome.**

Tetrad 42J (Hall 1980).

Not refound. This is a critical taxon and it is unclear if it is simply under-recorded in Britain today or has declined (Rich & Woodruff 1996); David Coombe remembers seeing it regularly in Britain in the 1950s but has not seen it for many years (pers. comm. 1996). Of unknown origin, but established in north-west and north-central Europe.

***Bromopsis ramosa (Bromus ramosus)*. Hairy-brome.**

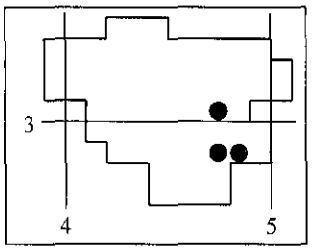


Frequent on the Forest (Hall 1980).

Restricted to the older bits of ancient woodland, hedges and tracks around the Forest. The skeletons of the previous year's plants persist through the winter and are easily recorded at all times of year.

Common and widespread in the Weald and in Britain. In Europe mainly in the west, south and centre. In Asia and Africa.

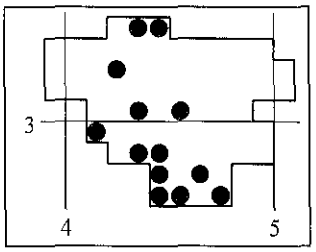
***Bromopsis erecta (Bromus erectus)*. Upright brome.**



Quite frequent on verges around King's Standing (473.302), pH 6.7, and also opposite Old Lodge car park on verge (470.306), 1987, PW and still present; verge near Radio Station (474.287), 1994, PW; frequent on verge east of Poundgate car park (483.285), 1993, Flora meeting.

A species more usually found on chalk grassland and occasionally on calcareous clays in Sussex, and rather unexpected on Ashdown Forest! Widespread in lowland England and Wales where it reaches its northern limit in Europe. South, west and central Europe, Asia and North Africa.

***Anisantha sterilis (Bromus sterilis)*. Barren brome.**

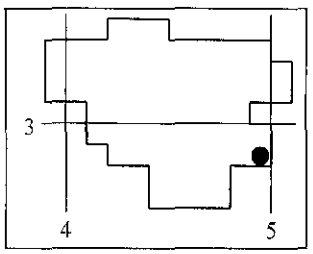


Four tetrads on the Forest (Hall 1980).

Occasional on verges and as a garden weed in the villages.

Very common in Sussex except on the Wadhurst Clay. Increasing in England (Rich & Woodruff 1996). Widespread in Britain, and mainly in west and central Europe and South-west Asia.

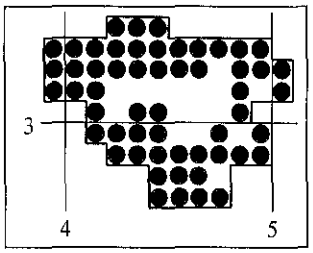
****Ceratochloa carinata*. California brome.**



East of Fairwarp (47.26), 1994, Flora meeting (RC, PW and MM).

Rare or absent in Sussex but increasing in England (Rich & Woodruff 1996). Native in North America.

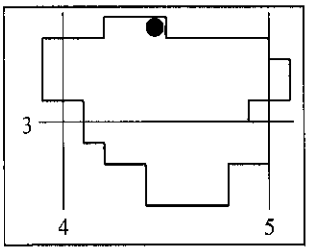
***Brachypodium sylvaticum*. False brome.**



Clearly restricted to the edges of the Forest, where it occurs on banks and in sunken lanes and in woodlands.

Widespread in the Weald and in 90% of the tetrads in Sussex (Hall 1980), a classic plant of coppiced woodlands. Widespread in Britain, Europe, temperate Asia and north-west Africa.

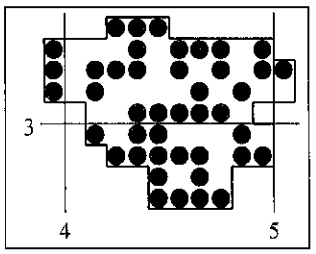
***Elymus caninus*. Bearded couch.**



One patch on north side of Parrock Lane opposite gate (449.345), 1994+, TR.

A species of sunken lanes, riparian woodlands, woods and hedges. Surprisingly rare in Sussex as a whole and very rare in East Sussex (Hall 1980). Widespread in Britain, Europe and temperate Asia.

***Elytrigia repens (Elymus repens)*. Common couch.**

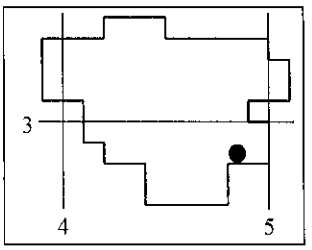


Frequent on road verges and most noticeable in 1995 when the verges were cut later in the year - it often grows along the edge of the carriageway in the Forest, but will occur on broader verges and in grassland elsewhere.

A variety with long awns (var. *aristatus*) also occurs (e.g. on verges west of Outback Farm) but has not been systematically mapped; the main reason for noting it is that it may be confused by the unwary with *Elymus caninus*.

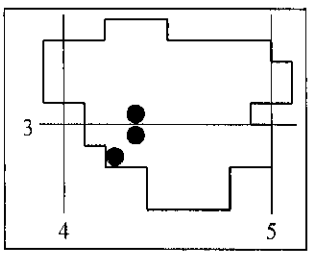
Recorded in 93% of the tetrads in Sussex (Hall 1980). Increasing in England (Rich & Woodruff 1996). Widespread in Britain, Europe and temperate Asia.

***Hordeum* sp. Barley.**



A very puzzling plant occurred on a ride in wet heath near Poundgate (48.28), 1994, PW which may be a barley (R. Payne, pers. comm. 1995). It presumably originated from seed in horse droppings.

***Hordeum murinum*. Wall barley.**

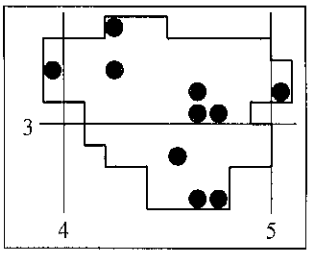


Chelwood Farm (42.28), 1994, TR; Millbrook car park round the litter bin where dogs urinate (438.299), 1995, TR; lay-by on A22 by Pippingford Park (437.302), 1994, TR. It is also present just outside the Flora area in several places in Forest Row.

This is an annual grass widespread in open communities in warm, dry areas of Europe and western Asia. It is a ruderal species of man-made habitats and requires high light intensity, low competition, moderately high soil pH and high soil nitrogen and phosphorus (Davison 1971).

In Sussex it is commonest on the coastal plain and is rare in the High Weald. Common in south-east England.

***Hordeum secalinum*. Meadow barley.**

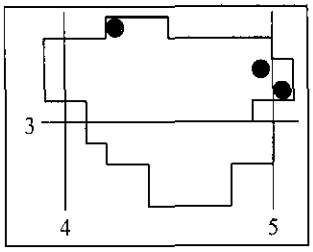


Tetrads 42U and 53A (Hall 1980).

Scattered on verges and very locally in meadows around the Forest. It was very much more noticeable on verges in 1995 when they remained uncut, which accounts for quite a lot of the records and it may be elsewhere but unseen. It is abundant around Gills Lap and frequent near King's Standing, with an isolated record near Spikey Brown's Cottage.

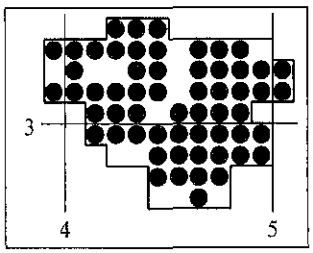
Locally common on the levels in Sussex, where it can tolerate very heavy grazing and improvement, and where it does appear to be associated with ancient grasslands on moist heavy soils. Mainly in south-east England and rarer elsewhere. In Europe mainly in the west (though absent from large areas in the centre) and in north-west Africa.

***Triticum aestivum*. Bread wheat.**



A few scattered records, mainly of plants on rides or disturbed ground associated with horses and near gardens.

***Danthonia decumbens*. Heath-grass.**

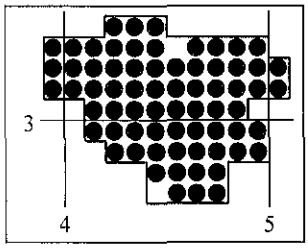


On the Forests, (Jenner 1845). Near Pippingford, 1904, J. Stirling (**TLS**). Common on the Forest (Hall 1980).

Locally frequent on rides and patches of acidic grassland, and occasional in heathland.

Occasional in Sussex on acidic soils and sometimes on the chalk, with Ashdown Forest as its major stronghold. Decreasing in England (Rich & Woodruff 1996). Widespread in Britain, especially in the north and west, and in Europe, south-west Asia and north-west Africa.

***Molinia caerulea* subsp. *caerulea*. Purple moor-grass.**



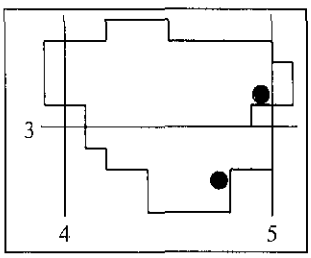
Very common everywhere on Ashdown Forest (Forster 1816). On the Forest, W. C. Unwin; Ashdown Forest, E. Jenner (Arnold 1887). Abundant on the Forest around Crowborough (Done 1914). Common on the Forest (Hall 1980).

Recorded widely on the Forest and often dominant over large areas of wet, acidic soils (pHs measured 3.6, 3.6, 3.9, 4.3 and 4.5). It is very common in flushes where there is water movement, and will survive in woodland under birch. It can be dominant on wet soils but where the drainage is better *Calluna* can dominate instead - this can be seen clearly down the slope at Bunker's Hill (498.319). It is abundant in the wet bottoms of the hollows at Dane's Graves immediately west of Churlwood car park (nobody knows what these strange linear features were for), it also dominates on trampled soils along wet paths. In the autumn the sugars are drawn back down into the roots and the leaves turn yellow, giving a characteristic autumnal colour to the Forest, and later turn white. The leaves are then abscissed and decay slowly, accumulating to become a fire risk. When burnt, the wet heaths tend to become dominated by *Molinia*.

Molinia tussocks in the stream bottoms in Old Lodge were nearly a metre tall in 1995. The tops were home to *Lonicera* plants but little survived between them except some *Scutellaria minor* and *Viola palustris* in the slightly more open patches. Sheep falling into the water between the tussocks may be unable to get out.

Locally common on wet heaths and sands in Sussex. Widespread in Britain, especially in the north and west. Widespread in Europe but mainly in the mountains in the south, Asia and north-west Africa.

***Phragmites australis*. Common reed.**

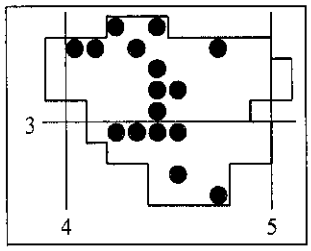


East side of lake near Oldlands Hall (473.274), 1994, Flora meeting; shaded woodland, Cow Field, presumably relict from old lake (see Plate 7), 1995, Flora meeting.

Mainly in the larger lakes and rivers in Sussex and on the grazing levels, and generally uncommon in the Weald. Widespread in lowland Britain, and probably one of the most widespread species in the world.

SPARGANIACEAE

Sparganium erectum. **Branched bur-reed.**



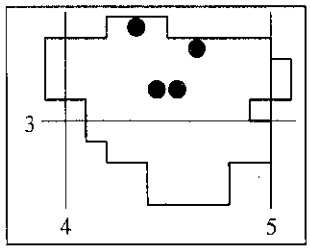
Six tetrad records (Hall 1980).

In ponds and along slow-flowing streams, especially along Millbrook through Pippingford Park. There are four subspecies, of which subsp. *neglectum* has been recorded from ponds on Stone Hill and south-west of Mudbrooks House, 1995, TR. The other subspecies could occur as they do not differ in ecology but they have not yet been recorded (Cook 1962).

Branched bur-reed is a perennial plant of swampy, wet places in water up to 1 metre deep, but it cannot tolerate desiccation (Cook 1962). It shows little preference for water or substrate quality, and is equally at home along the Medway and in the acidic, nutrient-poor ponds on the Forest. It does not tolerate deep shade or fast-running water and so is usually found on the more open, slow parts of streams. Spread by seed is apparently not common, but must be the mechanism by which it has reached many of our isolated ponds. Seeds pass though waterfowl unaffected, and they may float for more than a year. The bur-reed is palatable to stock and may have spread on the Forest since grazing was reduced.

It is widespread in Sussex and is locally frequent by ponds and in streams. Widespread in lowland Britain and temperate regions of the northern hemisphere.

Sparganium emersum. **Unbranched bur-reed.**



Bogs on Ashdown Forest (Coleman 1836). Tetrads 42N, 42T, 43H and 43K (Hall 1980).

Now confined to the north side of the Forest; minor stream 150 metres east of golf course clubhouse (433.341), 1995, TR & PS; Pippingford Park, frequent in stream bed upstream of Centre Bridge for c. 300 metres (449.316-452.313), 1995, TR & HP; stream near Hart's Farm (461.332), 1994, TR & SR.

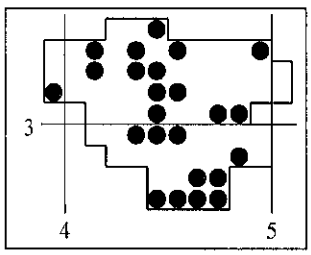
At Pippingford Park the plants that were exposed during the dry summer of 1995 had erect leaves rather like *S. erectum* but only about one third of the size, and flowered and fruited well. Plants in deep or swiftly-flowing water usually remain sterile (Cook & Nicholls 1986), and some vegetative plants in the Medway on the drive to Ashdown Farm (443.349), 1995, TR & PA may also be this species.

It is usually found in permanent water 20-80 cm deep and is tolerant of rapid changes in water level. It occurs in still or flowing water, and can withstand spates. Individual leaves have been found to last only 31-39 days. It usually occurs on clay or fine sandy substrates, and can be frequent on silt. It is most common in mid- to high-nutrient water but will grow in nutrient-poor water as on the Forest (Cook & Nicholls 1986).

It is occasional in Sussex and is widespread in lowland Britain. It is widespread in temperate regions of the northern hemisphere.

TYPHACEAE

Typha latifolia. **Greater reedmace, Bulrush, Common cat's-tail.**



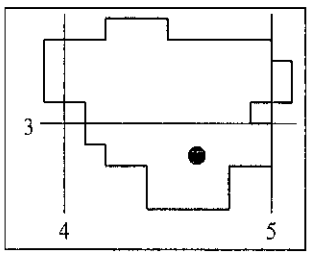
Six tetrad records on the Forest (Hall 1980).

Found mainly in ponds, marl pits and along the edges of lakes, but also in relatively dry ditches, and sometimes in wet patches in woodland (49.33). It occurs in a range of water and substrate types, but generally in locations that are wet in winter and dry in summer. It forms big patches and excludes most other species.

Common in Sussex and England, rarer in Wales and Scotland. Widespread in the northern hemisphere and the tropics.

PONTEDERIACEAE

****Pontederia cordata.*** **Pickerelweed.**

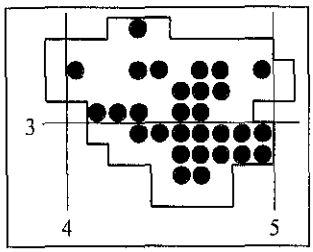


One plant in a new pond west of Ellison's Pond (462.287), late August 1995, AK. The plant was not there in June; this fact, together with the presence of one of the plastic containers used by garden centres for water plants close by in the same pond, leaves little doubt about the source of this plant!

Pontederia cordata is a rather attractive native of eastern North America and is widely available in garden centres. It is still relatively scarce in the wild, currently being known from only two other localities in Sussex. Once present it does seem to persist so we can expect it to remain in this site for some time unless someone decides to reclaim it for their garden pond.

LILIACEAE

***Narthecium ossifragum*. Bog asphodel.**



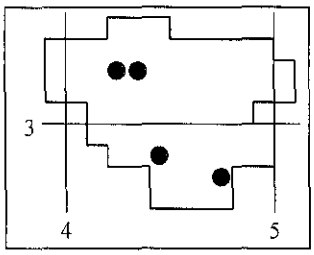
On the bogs on Ashdown Forest (Forster 1816). Bogs on Ashdown Forest (Coleman 1836). Ashdown Forest, M. R. Dixon, 1886 (Arnold 1887). Ashdown (Whitwell 1902). Plentiful on the Forest in the bogs around Crowborough (Done 1914). Ashdown Forest, in most of the boggy spots, plentiful, A. H. Wolley-Dod and MD (Wolley-Dod 1937). Many records for Duddleswell etc., in Dent (1928-1953). Frequent, mainly on the east side of the Forest, the obvious Sussex stronghold (Hall 1980).

Locally abundant in wet, acidic flushes in open heathland, mainly on the south side of the Forest. In July, the deep yellow spikes contrast with the pink of *Erica tetralix* to form spectacular sheets of colour.

The plant grows best where the summer water table is deeper than 10 cm from the surface and where lateral water movement and oscillations in the water table are frequent. It is intolerant of severe shading and below 30% of daylight it ceases to flower. It will tolerate a range of pH from 3.6-6.5, but is most common at a pH of 4.5-5.5 (two measurements from our sites are pH 3.6 and 3.9). Reproduction is mainly vegetative, although abundant seed is usually produced. The flowers are scented but produce no nectar and are generally cross-pollinated by insects; they are also self-compatible. Seeds may germinate immediately or up to a year later; seedlings were only rarely observed by Summerfield (1974), but have been seen frequently on bare peat by FR.

Very uncommon elsewhere in Sussex and south-east England, but abundant in west Surrey, the New Forest and the north and west of Britain. It is endemic to north and west Europe from Portugal to Sweden.

***Convallaria majalis*. Lily-of-the-valley, St Leonard's lily.**



'In the Forests, near Wych Cross' E. Jenner (Arnold 1887). Dent noted in 1945 that according to Ronnie Stevenson it had spread due to tree felling and dragging from one clump; he also visited it in 1946 and 1947 (Dent 1928-1953). Wych Cross in larch woodland, c. 1956, R. Green. Tetrad 43G (Hall 1980).

The native sites known today are east of Wych Cross, where the lily occurs on the ridge rather than in the valley. The main site is in the small area of National Trust woodland east of the Nursery (423.322), pH 2.8, where it was first found and is of particular interest as the plants are probably native. During the 1970s when the larch plantation was cleared the tall bracken hid the plants which were rediscovered on a Flora meeting on 17 May 1995 when MR & PR took us to within 20 metres of it saying "it was here somewhere..." - almost immediately patches were found scattered frequently over an area of about 40 metres x 15 metres. It is usually a woodland plant, but was growing without tree cover except for a few young birches, shade being provided instead by bracken, with bluebell, bilberry, heather, wavy hair-grass and foxglove. The woodland itself is reported as ancient woodland in the *Sussex Inventory of Ancient Woodland* but now has little tree cover, partly due to storm damage. Subsequent to the Flora meeting, another vegetative patch was found about 30 metres east of the Forest Centre car park just off the road verge (433.323), pH 3.3, 1995, PW, and another patch c. 5 metres long was found, presumably planted, in front of Spikey Brown's Cottage (425.324), pH 3.1, 1995, TR; both also appear to be the native material.

There are also scattered records of plants of garden origin at Nutley in secondary woodland at Morrisfield (448.283); and in the lane below the gardens at Ashdown View (444.286), 1994, Flora meetings; and near Summerford (470.264), 1994, TR. It is widely grown in gardens around the Forest.

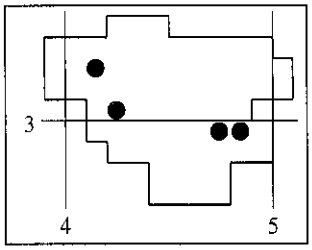
The native plants differ from those grown in gardens. Wild plants have small leaves which are noticeably glaucous, they flower later (they were just beginning to flower sparsely on our visit), and the inflorescences have an average of only 5.5 flowers each. By contrast, plants of garden origin are usually more robust, bright green, flower more profusely earlier in the year, and have more flowers on each inflorescence with means of 9.9 and 11.7 flowers per inflorescence for two garden populations; plants for sale in the Wych Cross Nursery in 1995 were of this latter type! Dent (1928-1953) also noted that the wild plants at Wych Cross were much smaller than his garden plants. Three days after the Flora meeting, AK visited the famous Lily Beds in woodland in St Leonard's Forest and found similar plants to our wild ones, and they are the same native form as the other Sussex plants. Wolley-Dod (1937) noted that wild plants often do not flower; about 5% of the plants were flowering at Wych Cross in 1995, and only about 10-15% of the St Leonard's plants.

PA has studied fruit set of the Wych Cross population: 18 plants were marked in early June in flower, but three weeks later not one fruit had been formed. Similarly, large wild patches at Dallington Forest in Sussex also produced no fruit in 1995, and neither of the two garden populations produced fruit. This may be because the populations are clones (the lilies spreading by the creeping rhizomes), and plants with different genes are needed to cross-fertilise them, but some garden plants do set fruit apparently in isolation.

Wolley-Dod (1937) noted 36 sites in Sussex including Harrison's Rocks and High Rocks but it appears to have gone from many, and Hall (1980) only gave about 20 records in the *Sussex Plant Atlas*, including some garden escapes; it is probably in decline in Sussex. It would be nice to restore the Wych Cross woodland back to what may have been the original sessile oak - bilberry woodland to give it a more secure future.

Convallaria is scattered in southern England, locally frequent in rocky woods in the north and west, widespread and sometimes common in Europe and Asia.

***Polygonatum* × *hybridum* (*P. multiflorum* × *odoratum*).** **Garden Solomon's-seal.**



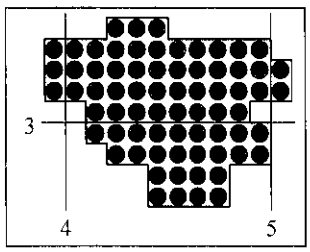
This has been recorded in scattered localities, sometimes dumped in car parks but also one well away from an obvious source of introduction: one plant in Warren car park (416.320), 1994, TR; woodland edge opposite houses by A22 (429.309), 1994, TR; dumped spoil opposite Radio Station (473.292), 1994, SBRS; one clump in woodland away from house, Poundgate (489.290), 1994, PD & TR. Also reported planted in woodland near the lakes in Pippingford Park, A. Morriss.

In 1995, two clumps were noted to be heavily damaged by Solomon's-seal sawfly larvae and neither could be found later in the year. The female sawflies use their ovipositors like miniature saws, and put eggs directly into the tissues of the plant. The larvae are about 1 cm long and look like green caterpillars. They begin feeding on the underside of the leaves, then they eat the tissue between the veins, and finally entirely strip the plants of their leaves, sometimes defoliating whole plants.

This plant probably originated in cultivation. The parents grow together in very few places in Britain but do so in hundreds of sites in Europe but natural hybrids are unknown in many countries. The nearest natural *P. multiflorum* is probably in the woods east of Tunbridge Wells, and the nearest *P. odoratum* is in Gloucestershire.

Probably quite widespread in Britain as a garden escape.

***Hyacinthoides non-scripta*.** **Bluebell.**



Common on the Forest (Hall 1980).

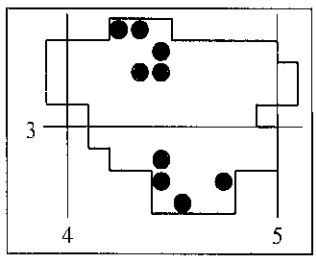
Recorded in every square, where it occurs in woodland, on heathland in the open or under bracken, in acidic grassland, in hedges and on hedgebanks (pH measurements 3.7, 4.7 and 4.8). Bluebells are usually more abundant in the older areas of woodland than the adjacent areas of Forest - for instance it grows in sheets in the chestnut coppice on the south-east side of the road at Wood Eaves (483.318) whilst on the other side of the road on the open Forest they are very sparse; but they are not restricted to ancient woodlands. They were noted to have flowered better in some sites which had been opened up in the 1987 storm (*AFN* 15: 2-4).

White-flowered plants occur naturally as scattered plants in woodland around the Forest, and at Highgate where they have probably escaped from gardens. Riding (1977) found white bluebells to have a lower reproductive output in the wild though it was similar in the garden, and seed from white bluebells ultimately produced normal blue-flowered plants indicating high rates of out-breeding. Prior to the First World War, bluebell bulbs were collected for export to Holland (Mrs E. Vernon, Horney Common, pers. comm. to MR). Picking or pulling the flowers has no effect on the numbers of flowers in following years, but the associated trampling and damage to the leaves can result in a considerable reduction (Peace & Gilmour 1949).

Populations of the introduced muntjac deer are increasing in the area. These deer eat both bluebell leaves and flowers, especially in early spring when there is little other food available, and damage to the plants leads to decreased reproduction and loss of vigour in subsequent years. They also eat other plants such as *Mercurialis perennis* and *Dactylorhiza fuchsii* (Cook *et al.* 1995, and pers. comm. 1996). We think the bluebells are more important than these alien deer.

Very common in Sussex and most of Britain. They are endemic to western Europe from north and west France to Scotland and south-west Belgium, and our bluebell woods are internationally important.

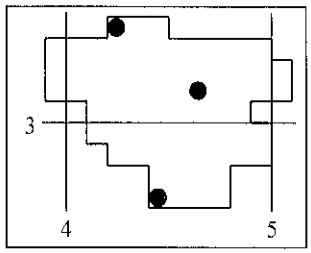
***Hyacinthoides hispanica* × *non-scripta*.** **Hybrid bluebell.**



This is the commonest bluebell in gardens, and consequently was mainly found near houses around the villages of Forest Row and Nutley. It is widely recorded in Britain and is increasing.

It differs from *H. non-scripta* in having blue anthers, broader leaves and open bell-shaped flowers (Rich & Rich 1988). There is concern that introgression hybridisation between the bluebells could result in genetic erosion of one of our most important plants.

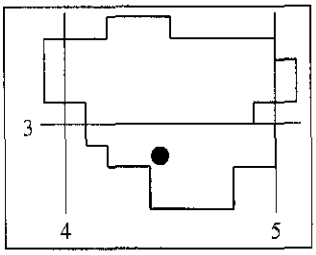
***Hyacinthoides hispanica*.** **Spanish bluebell.**



Three records from Forest Row, Nutley and dumped soil at Gills Lap. Many of the records in the *Sussex Plant Atlas* are likely to be of the hybrid.

Increasing in England (Rich & Woodruff 1996). Native in south-west Europe and north-west Africa. In Portugal the plants are less robust than our cultivated plants, implying some horticultural selection.

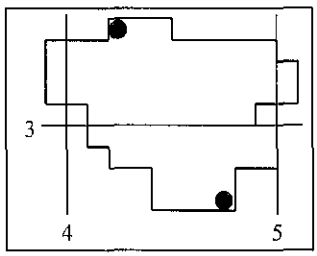
Allium triquetrum. **Three-cornered garlic.**



A few clumps spread along c. 10 metres of a sunken lane outside garden north of Nutley (444.286), 1994, SBRS. As yet it does not seem to have spread in Sussex to the extent that it has elsewhere in south-west England, and should be monitored and eliminated if necessary. It is grown in some gardens locally.

Increasing in England (Rich & Woodruff 1996), especially in the south-west. Native in the western Mediterranean.

Allium paradoxum. **Few-flowered garlic.**

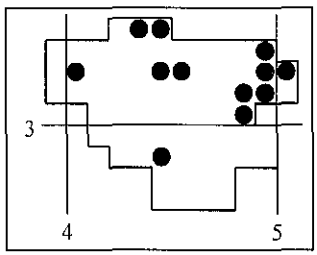


Spreading from a garden onto the verges of the A22 at Forest Row (422.342), 1978, PS and spreading ever since; small patch in scrub at the west end of Highgate Lane (424.344) 1995, TR; one patch on A26 near Holly Corner probably established from dumped garden rubbish (479.267), 1995, TR. Conspicuous in flower in the spring but difficult to see later in the year.

Our plants have both flowers and bulbils. Barling (1958) noted that this Caucasian species reproduces almost entirely from the bulbils, and by bulblets produced on the bulbs. The inflorescences tend to have only one flower and although seed was found in small quantities no seedlings have been seen.

Recorded occasionally in Sussex and Surrey but not in Kent, and scattered in Britain. Native in the Caucasus and Iran.

Allium ursinum. **Ramsons.**



Tetrads 42P, 43L, 43R and 43V (Hall 1980).

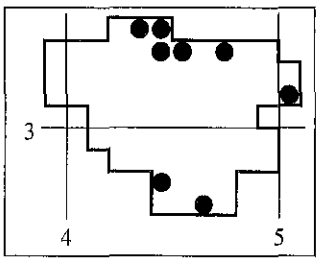
After noticing we only had one record from 1993 and 1994, a more careful nose was kept out for it in 1995: ditches by entrance to Hindleap Farm (404.328), 1995, TR; woodland by Forest Road (436.347), bank of disused railway (441.347) at Forest Row and garden throw-out near Stone Cottages (44.32), 1995, TR & PA; bank of Kidd's Hill (459.321), 1995, MM; in an old lane at Nutley (444.286-446.289), 1994, SBRS; also found down main river valleys on east side of Forest in both ancient and secondary woodland where it is obviously washed down by the streams - it has been traced as far upstream as Old Mill Farm (488.303) and Home Wood (505.327), 1995, TR *et al.* Planted in marsh west of Fairwarp Village Hall (466.264) by B. Hoath in 1995 (not plotted).

It is evidently very rare on Ashdown Forest land itself, perhaps not surprisingly as it is generally regarded as an ancient woodland indicator species. It is only frequent on the shaded river alluvium on the east side of the Forest, but most of the patches associated with garden rubbish which also occur in damp, shaded sites are quite small. The name *ursinum* means 'sought after by bears', derived from the European brown bears' habit of eating the tubers; the only bears now known on the Forest prefer sweeter food made from nectar.

Ramsons is unusual for a plant which forms large single-species stands in that it mainly depends on reproduction by seed to survive from year to year. The seeds are shed in June and July but generally fall close to the parent as 75% of the fruiting heads are prostrate by the time they are ripe, and it has a poor dispersal mechanism. The seeds germinate after a period of warmth followed by cold, so mainly germinate in early spring. The plants then flower from their (fourth-) fifth to seventh (-eighth) years. A small proportion of the plants also produce bulbils (Ernst 1979).

Locally frequent in the Weald and widespread in Britain but much rarer in Ireland. Widespread in Europe except the north-east but rare in the Mediterranean, and in Asia Minor.

Galanthus nivalis. **Snowdrop.**



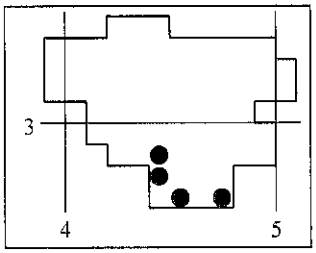
Crowborough Warren (Done 1914).

Recorded in churchyards, roadsides, outside gardens and occasionally in hedges. All the records are new to Hall (1980), and more appear each year. A double-flowered form '*flore pleno*' occurred in a verge near Coleman's Hatch (448.339), 1994, TR.

For many years it has been wondered if snowdrops are native in Britain. Recent work by Aaron Davis at Reading has shown that the pattern of variation seen in British 'wild' populations is muddled and does not fit the pattern observed in its home range in central Europe and Asia Minor, and many of our populations can be matched to plants, say, from Italy or the Pyrenees. They also set little seed, possibly due to poor pollination as our bees are not very active early in the year. Snowdrops are now considered to be garden escapes.

Widely naturalized and increasing in England (Rich & Woodruff 1996).

***Galanthus nivalis* × *plicatus*. Snowdrop.**



Nutley, churchyard (442.278) and road bank opposite Bramley Bank (447.287), 1994, TR; Boringwheel Mill Farm (456.264), 1995, TR; Fairwarp (47.26), 1995, PD & RN. All confirmed by PH.

This hybrid probably originated in cultivation.

***Narcissus*. Daffodils.**

Narcissus is a large genus with numerous cultivars which makes identification very difficult. We have only attempted to map three taxa; *N. pseudonarcissus* native and introductions, and *N. poeticus* although more taxa are present. Many taxa are planted on roadsides, etc., perhaps marking the sites of accidents, some persisting from garden rubbish and some simply planted to brighten the countryside in the spring. ***Narcissus poeticus*, Pheasant's-eye daffodil**, and hybrids are frequent on verges, flowering mainly after the common daffodil; they are endemic to southern Europe. Miniature-flowered taxa occur planted on verge at Marsh Green and as a garden escape at Marden's Hill.

***Narcissus pseudonarcissus* subsp. *pseudonarcissus*. Daffodil, Lent lily.**

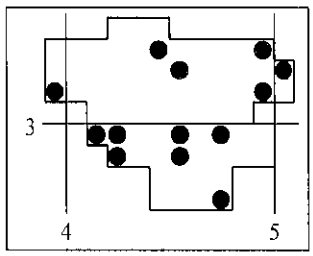
Pippingford stream and Millbrook, 1942-1947, and 50 noted in 1952 (Dent 1928-1953). Hundreds by lakes, Pippingford Park, 1956, R. Green. Tetrads 42N, 42T and 43A (Hall 1980).

The native plants grow to about 30 cm tall and have outer perianth segments paler than the inner. They can form large patches in some of the older woodlands or scattered along the streams, and when abundant are a beautiful sight as their scent drifts gently on the wind. The Morriss family have planted many (including the native taxon) around Pippingford Park since before the First World War, and gypsies from London used to pick them to sell (pers. comm. A. Morriss 1995). The native plants are thought to occur in south and west Britain north to Cumbria; they are endemic to western Europe from France north to Germany and England.

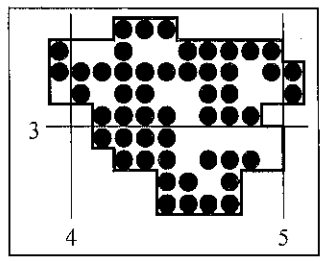
Barkham (1980a, b) studied population changes in a woodland in Cumbria over a 10 year period and found that the changes in population size were related to the effect of a varying environment on the rate of clonal growth of bulbs. The rate of reproduction from clonal growth was greater than that from seed, and consequently many populations show marked clumping. He found they grow best on sites with a high available moisture capacity and moderate shade. pH measurements from our sites are 4.8 at Millbrook and 4.7 near Friar's Gate.

We have also mapped *N. pseudonarcissus* cultivars which comprise plants of subsp. *pseudonarcissus* which are taller than 30 cm and have large flowers which are scattered around the woodlands and may have been planted, and much larger and more robust cultivars which have escaped from gardens or been planted in churchyards and verges; especially commonly planted is the Spanish daffodil (subsp. *major*) which has concolorous flowers.

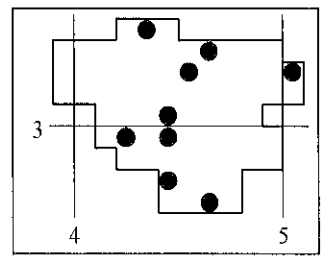
N. pseudonarcissus native



N. pseudonarcissus cultivars



N. poeticus and hybrids



Some introduced plants are spreading down streams and are becoming naturalised. Some mixed populations occur and potentially there could be hybridisation between the garden escapes and wild plants. We investigated one mixed population along the stream near Oak Plat (499.336) and compared them with plants by the Half Moon upstream (498.333) and with another separate isolated native population at Millbrook (44.29). As yet there is no evidence of hybridisation between them, the wild plants and the garden plants forming dicrete groups as shown in Figure 15 below:

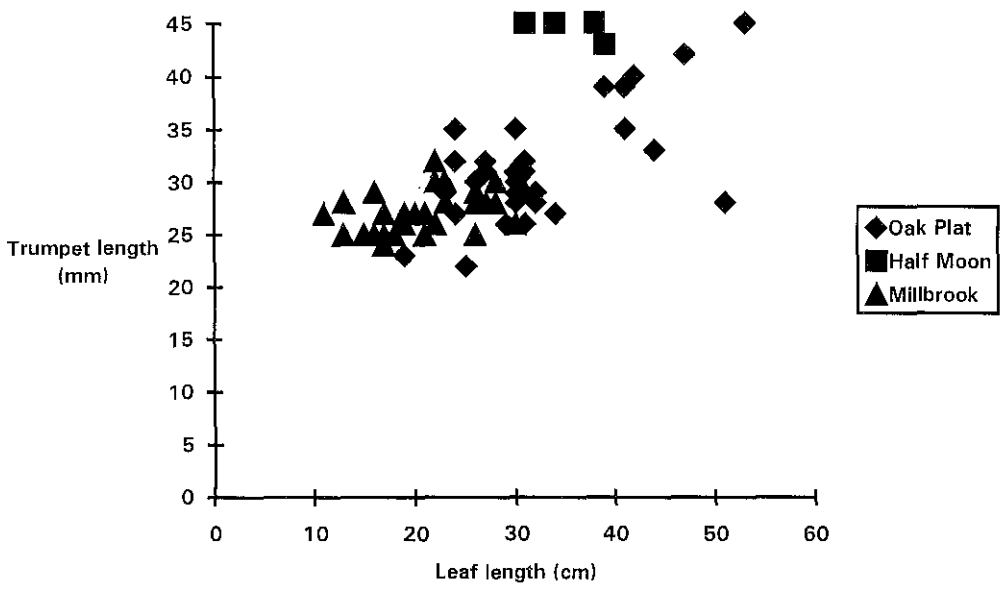
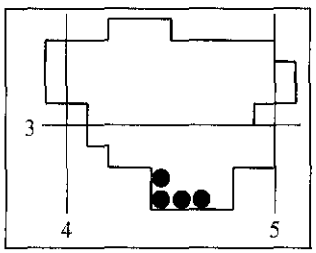


Figure 15. Graph showing plot of leaf length against trumpet length for three populations of *Narcissus pseudonarcissus*.

***Ruscus aculeatus*. Butcher's-broom, Knee holm.**



Ford's Green near Nutley, abundant (Deakin 1871).

One clump in hedge on the north side of the track to Hunter's Farm (448.265), pH 5.8, 1994, TR; six clumps in one patch opposite Ford's Green (446.271) and clearly no longer abundant (cf. Deakin 1871 above), pH 4.3, 1995, TR; two patches in one clump opposite farm, Toll Lane (459.263), pH 4.3, 1995, AFRR, only noticeable once the woodland had been coppiced; four clumps in one patch by sunken track, Toll Lane (461.263), pH 4.4, 1992+, NM; one plant on west side of B2026 about 100 metres south of Fairwarp Church (465.266), pH 4.4, 1995, TR - part was moved to Fairwarp Village Hall (467.263) in about 1980 by B. Hoath when it was thought to be under threat from road widening, and is surviving well under another beech tree; two clumps (apparently native) occur in wood edge north of track 100 metres to the east (468.264), pH 4.1, 1995, B. Hoath.

Plants were just coming into flower in mid-November 1995. Every bush has been examined and all appear to be female; no berries have been seen. There may be more in the Cackle Street - Fairwarp area. With the exception of the Hunter's Farm plants, all are on acid woodland litter pH 4.1-4.4, but it will grow on chalky soils too.

Locally common in Sussex, and sometimes planted for ornament, pheasant cover, and perhaps even for butcher's brooms. Probably native in southern England and Wales, but widely introduced elsewhere presumably by butchers. Widespread in western, central and southern Europe north to Britain.

IRIDACEAE

***Sisyrinchium montanum (S. angustifolium).* American blue-eyed-grass.**

In an old grass road near Chelwood Gate, 1913, J. A. Dell (Wolley-Dod 1937). Naturalized in Furnace Wood, tetrad 42T, 1972, J. Milner (Hall 1980), but not refound.

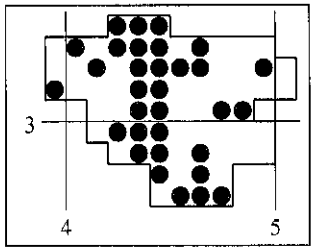
Occasionally naturalized in Britain. Native in North America.

***Iris foetidissima*. Stinking iris, Roast-beef plant.**

Tetrads 42T, 43H and 43M (Briggs 1990).

Not refound. It is possible that vegetative plants of *Iris pseudacorus* in quite dry sites on Ashdown Forest are sometimes recorded as this species in error. Locally frequent on the chalk in Sussex and usually in woodlands. Native and increasing in England and Wales (Rich & Woodruff 1996). It occurs in western and southern Europe and North Africa, and Britain is its northern limit.

Iris pseudacorus. **Yellow iris, Yellow flag.**



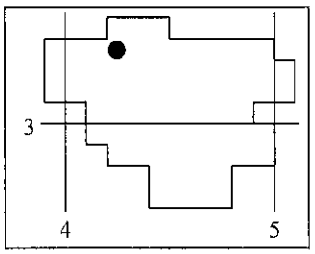
Frequent on the Forest (Hall 1980).

We have recorded it frequently by ponds and streams, the bright yellow flowers conspicuous in early summer. It tends to occur in the wetter patches in meadows and on the edges of ponds, but not in deeper water. It is probably planted in some ponds.

It typically grows on soils with a high water content and is fairly tolerant of anoxic conditions, but it does not need to be submerged and can grow in some dry sandy soils. The soils vary from pH 3.6-7.7, but it has a high nitrogen requirement. It occurs in a range of mire and open woodland types, usually forming patches; after flowering the rhizome's terminal bud dies and growth is resumed by two lateral buds producing dense stands. The rhizomes degenerate after 6-15 years resulting in separation of clonal patches (Sutherland 1990).

Common in wet places in Sussex and throughout lowland Britain. It occurs in Europe, western Asia and North Africa.

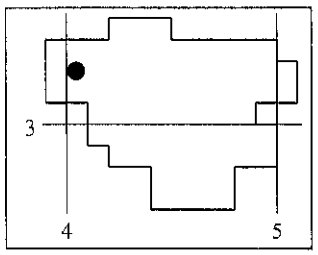
Iris versicolor.* **Purple iris.



Pond at Tompset's Bank (424.338), 1995, PW, with either *I. pseudacorus* or a hybrid.

A frequent garden escape in Britain. Native in North America.

Crocus vernus.* **Spring crocus.

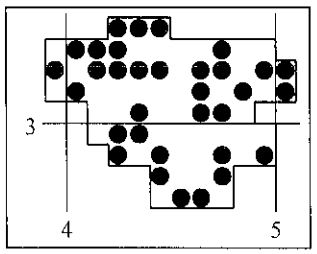


Goat car park (402.326), 1995, TR & JK. Plants with deep purple flowers occur planted outside a number of gardens and in churchyards, but can scarcely be considered as naturalized.

We have also found leaves at a number of sites on the Forest, but have had no flowers to confirm identification. A mass of *Crocus* was reported as appearing in clumps on a track repaired with imported topsoil, B. Willard (*AFN* 16: 16-17).

Widely established as a garden escape or planted in Britain. Decreasing in England (Rich & Woodruff 1996). Native in central and southern Europe.

Crocosmia* × *crocosmiiflora (Tritonia* × *crocosmiiflora).* **Montbretia.



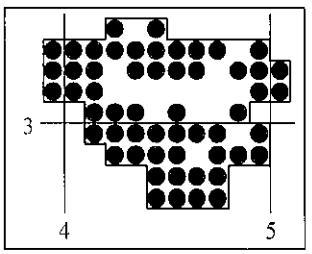
Frequent on the Forest (Hall 1980).

Widespread around the Forest, well-established and spreading vegetatively in many woodland and wood edges.

Widely naturalized in Sussex, especially in the Weald, and in Britain. It originated in cultivation.

DIOSCOREACEAE

Tamus communis. **Black bryony, Poison-berry.**

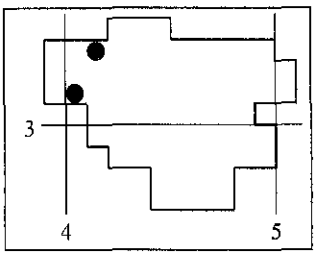


Widely dispersed in hedges, ancient and secondary woodland, and sometimes heathland edges, including one plant at the Airman's Grave. It occurs mainly round the edges of the Forest. It has been suggested to be a poor colonist and to occur predominantly on calcareous soils, but our plants behave differently.

Recorded in 92% of the tetrads in Sussex (Hall 1980). Locally abundant in England and Wales north to Cumbria, the only British representative of the yam family. Widespread in southern and western Europe and Asia Minor, with Britain as its northern limit.

ORCHIDACEAE

Epipactis purpurata. **Violet helleborine.**



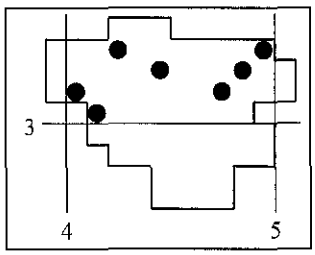
Tetrad 42T (Hall 1980). Five Hundred Acre Wood, 1987, SBRS (tetrad 43W) (Briggs 1990), and two other tetrads -see below.

Two plants on Twyford Lane verge north of Suttons Farm (403.314), pH 4.0, DB, where four plants first found in 1988 were still present in 1994 but eaten off by deer or slugs; south-east side of Priory Lane (413.339), several years up to 1990, AK, but not seen 1993-1995. Another possible plant occurred at Faggot Stack Corner, 1983, CM & R. Tallack, where 'funny' plants have also been seen by PW.

Quite variable in colour, and not always dark purple. More shade tolerant than *E. helleborine* and often found in deep shade; usually considered an ancient woodland indicator but 2/3 of our localised records are in secondary woodland.

Scattered in Sussex, mainly on clays and somewhat calcicolous. It occurs most abundantly in Oxfordshire, Berkshire and Buckinghamshire, with the Weald as a second stronghold. It occurs in southern and eastern Britain to the Welsh borders. An endemic of north-west and central Europe.

Epipactis helleborine. **Broad-leaved helleborine.**



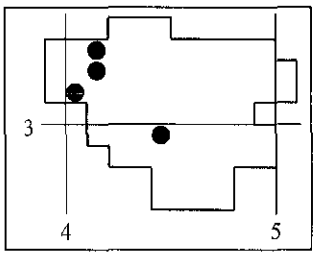
Five Hundred Acre Wood near Fishers Gate, 1914 (Done 1914), recorded again in Hall (1980), and still present in abundance in a shaded hollow on the south-east side of pond (490.331), 1994, ER & RN.

Our other records are as follows: three spikes by track to Press Ridge Warren (407.318). 1987, PW & RW; Wych Cross Reservoir car park (419.315), 1987, CM; four plants on woodland edge, outside Isle of Thorns (416.303), 1995, Flora meeting; one plant in scrub by pond (423.338), 1995, PW; one plant in gully on Ridge Road (443.326) mown in 1995, PW; Wood Reeves Car park (475.309), 1993, C. Sutton; Faggot Stack Corner (48.32), 1983, CM & R. Tallack, and 1987, PW & RW. So we have it scattered in quite a few sites, but rarely in abundance and rather of the 'here one year, somewhere else the next' type.

Elsewhere in Sussex it is also typically a plant of verges and the edges of wood or scrub, and it is locally frequent. The colour may be very variable and it can sometimes be difficult to distinguish it from *E. purpurata*; if in doubt this species has rough calluses at the top of the epichile, whilst they are smooth in *E. purpurata*. It is pollinated by *Vespula* wasps and flowers at about the time the drones leave the nests.

Widespread in lowland Britain, and in Europe, Asia and North Africa. An introduced widespread and problematical weed in North America.

Neottia nidus-avis. **Bird's-nest orchid.**



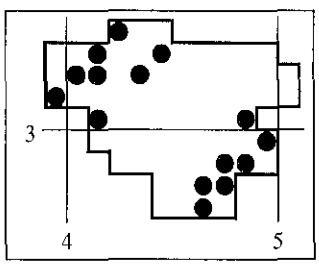
Near Nutley, frequent by roadside, H. Wheeler (Wolley-Dod 1937). Tetrad 42T (Hall 1980). Friar's Gate road (477.311), 1983, AFRR. In the 1970s it used to occur under beeches on the south side of Ridge Road near Ashdown Park (428.323-432.323) but the beeches were removed and replaced with a broad verge. A few plants also occurred regularly at the entrance to Spikey Brown's Cottage (425.324) but have not been seen recently.

Twyford Lane (406.316), pH 5.1, 1992+, NM and before (accidentally mown in 1995); A22 verge north of Wych Cross (419.325), 1992, CM, and 1 huge plant and 2 small ones at base of sign where it got mown (419.323), 1993, and 2-3 plants also occur regularly in another site to the north from the mid-1980s, PS; Priory Road, two separate clumps (c. 411.337), pH 6.2, NM, 1994 - it was also seen on the north-west side of Priory Road about 409.336, 1986, AK, and at 413.339, c. 1985 and 413.338 c. 1990, PS, CM, but not seen again in 1993-95 and obviously crops up at more than one spot; Pippingford Park (c. 445.299), one plant eaten by deer, 1995, A. Morriss.

Commoner in West Sussex than East, and usually in old deep beech leaf litter on the chalk, but as on Ashdown Forest also scattered across the less calcareous soils in Surrey and Kent. Apparently it can set seed whilst still underground as pollen may be carried by creepy crawlies (D. Lang, pers. comm. 1995).

It is scattered through lowland Britain, especially in the south and east, but is decreasing in England (Rich & Woodruff 1996). It is widespread in Europe except the far north and occurs across Asia.

Listera ovata. **Common twayblade.**



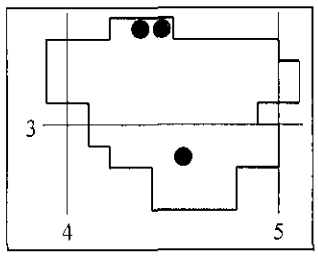
Occasional on the Forest (Hall 1980).

Our distribution map shows two main areas, one in the north-east where it occurs as a few plants on verges, and then common in Toll Lane Coppice and Fairwarp areas where it prefers the richer clay soils. One group appeared in an area where birch had been cleared after the Great Storm near Hindleap, CM (*AFN* 15: 2-4). Occasional plants also occur on roadside elsewhere, forming lines by the creeping rootstock.

One of the commonest Sussex orchids, but decreasing in England (Rich & Woodruff 1996). Widespread in lowland Britain, and widespread in Europe and Asia. 1995 was a good year for it.

No *Listera cordata,* Lesser twayblade, has been found on the Forest, though the habitat could be considered suitable now but it may have been grazed too much historically; the nearest report is from Gravetye, last seen in 1975 (Hall 1980).

Spiranthes spiralis. **Autumn Lady's-tresses.**



Roadside near Nutley, J. H. A. Jenner (Wolley-Dod 1937), presumably the same site as we recorded it scattered along the verge near Stonehill car park (456.288), pH 7.8; population counts from David Lang, MR and others are as follows: 1977, 1 plant (a lady's tress?); 1983, 50 plants; 1987, 60 spikes; 1988, 7 plants; 1989, 52 plants mostly eaten off leaving 3; 1990, 148 plants; 1992, few spikes; 1994, 20+ plants; 1995, 61 plants. One clump with five shoots on uniform, modern, rye grass lawn, Lines Farm (445.347), first noticed 1995, H. T. Stubbs. Leaves were first spotted on a mown verge on Rystwood Drive, Forest Row (438.344), pH 6.2, April 1995, TR and the plants flowered from August despite the drought; although these plants were spared the mower most were nobbled by slugs later. Rosettes appeared again in mid September.

This species could be much more widespread over the area on lawns of large houses (e.g. East Court, Coleman 1836, or Brockhurst, Hanbury 1917) where it has obviously been for many years but does not flower, due to regular mowing. However, our Lines Farm record indicates it is not always on old grasslands. The plants on the verges tend to be single, isolated plants but those on lawns tend to occur in clumps with many flowers and numerous rosettes - this is assumed to be a response to the cutting. Half of the spikes curl to the left, and half to the right (D. Lang, pers. comm. 1995).

Occasional on chalk and clay in Sussex. Widespread in southern Britain but decreasing in England (Rich & Woodruff 1996). It occurs in southern, western and central Europe, Asia Minor and North Africa.

Hammarbya paludosa. **Bog orchid.**

Large bog, Kidbrooke, 1846, W. McIvor (**BM**; Hanbury & Marshall 1899). Pressridge Warren near Wych Cross, 1841, and abundant on the great bog near Kidbrook Park Pales (Deakin 1871). Near East Grinstead, 1873, W. W. Reeves (**BM**). Bog near Kidbrook Park, Miss A. Wallis, 1877 (Arnold 1887). Bog between Hartfield and Gills Lap, 1895, E. S. Salmon (**BM**; Arnold 1907). *Sphagnum* bog by stream running from Pressridge Warren near Chelwood Gate, 1898, C. E. Salmon (**BM**). Ashdown Forest near Nutley, 1907, J. Roffey (**BM**). Stumblewood Common (probably outside our area), W. E. Nicholson; Chuck Hatch (probably the same locality as 'Bog near Hartfield'), 1922, W. E. Nicholson; Crown Well near Camp Hill (probably 4715.2935), 1923, R. J. Dix (Wolley-Dod 1937). Bog west of Fairwarp (actually a "reservoir" filled with *Sphagnum*, FR, pers. comm.), 1952, Oliver Buckle, who described the locality in a letter to DS in July 1958 "I last saw *Hammarbya* at map reference 463.270 [this equates to a wood in Spring Garden, and is probably an error for c. 457.274]. If you go to Fairwarp Church and work a bit north west until you reach the stream, and then follow the stream south searching the *Sphagnum* carefully. There was quite a bit in a small area with *Gentiana pneumonanthe, Narthecium* and *Sphagnum*."

Alison Ross (in Hall 1980, p. 7) recorded that George Dent had noted bog orchid 'in a redundant tank-trap' (but see below) on Ashdown Forest. By a series of coincidences his diary has been traced (TR's grandmother shared a nursing home in Midhurst with Lady Stratton whose sister, Phyllis Green, lived next door to George Dent near Wych Cross and inherited the diary when he died in 1959). It gives breathtaking, detailed account of the two sites and the plants between 1928 and 1952; George was obviously fascinated with the plants and visited them regularly observing flowering, fruiting and the bulbils on the leaves. He used binoculars to spot the plants and notes having bare feet in the marshes!

His records have been summarised as follows. He first saw very small plants at Chuck Hatch on 24 August 1927 in a wet marsh with *Sphagnum* and saw three plants in 1929. At Duddleswell (which he called Break Neck Gill) he knew what appear to be five different places, though the records are somewhat difficult to interpret (the Tea Table Marsh site presumably matches Buckle's site):

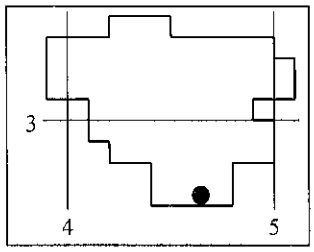
1929, two plants (he cut the flowers from them), and one upstream.
1930, two plants.
1931, three plants.
1932, three in clump near bogbean, one on Tea Table Marsh.
1934, one plant on Tea Table Marsh, two in marsh below and twelve in marsh above in red *Sphagnum*, plus four plants in new site downstream with *Rhynchospora, Hypericum elodes* and *Narthecium*, and another upstream.
1937, one plant seen with Dennis Fanshawe on other side of stream.
1943, one with leaves well developed in bareish wet place, Tea Table Marsh. A tank had been in and left tracks which had filled with water to form a pool - this is the origin of the erroneous 'redundant tank-trap' report.
1944, two plants with *Narthecium*.
1949, three in old place, two had 10-12 flowers each
1952, gorse bush bank

In about 1956, George Dent took Phyllis Green and Robert Green (aged 11) to see the plants in Break Neck Gill, and Robert remembers tiptoeing across *Molinia* tussocks close to the water and being shown them through a magnifying glass which he still has today. This is the last record we have traced, and our bogs and orchids are not what they used to be. Press Ridge Warren is now conifer woodland. The bog by Kidbrook Park is still there but is scrubby and covered in dense *Molinia*, the bog near Hartfield may have been Wren's Warren which has suffered a similar fate. The Crown Well is simply dense *Molinia* and the bog west of Fairwarp is dense scrub. There are small open flushes still in Breakneck Gill. The area has been searched on many occasions in the 1960s and 1970s by Oliver Buckle, Ron Boniface and others, and we have

been unable to refind any bog orchids. Although there are very few places on the Ashdown Forest which now appear suitable it is worth emphasising that the plants are very small and can be extremely hard to spot. So, if you visit any of the remaining bogs on the Forest, do keep your eyes open - we would be very pleased if someone could refind them.

Unfortunately Ashdown Forest is not unique and the bog orchid has disappeared from south-east England due to loss of suitably wet habitat. It is now mainly found in the north and west of Great Britain though large and significant populations still occur in the New Forest; in these areas it seems to be holding its own. It is a Nationally Scarce Species and has been recorded in 95 10-km squares since 1970 (Porter 1994). Outside Britain it occurs mainly in northern and central Europe where it is under threat, and it is also known from Asia and North America.

Platanthera chlorantha. **Greater butterfly-orchid.**



One plant by Kidbrook Paling, 1945, G. Dent (1928-1953). One destroyed by ditching work at Fairwarp, 1970s (B. Hoath, pers. comm. to MR).

Toll Lane (461.262), pre-1970, 1993, and two plants, one trodden on by deer in coppice, 1994, Chris Weaver; one planted in wood near Fairwarp Village Hall (466.263) in 1980s, last flowered in 1993 (not 1994 or 1995), B. Hoath.

This is usually a woodland plant on chalk or clay in Sussex, or in grassland adjacent to woodland, but is very uncommon. It is said to be pollinated by moths at night when the white flowers show up well and it has a strong scent.

It is locally frequent in Britain, especially in the south-east and in western Scotland. It is also frequent in north Wales in small hayfields. It is widespread in much of Europe and Asia.

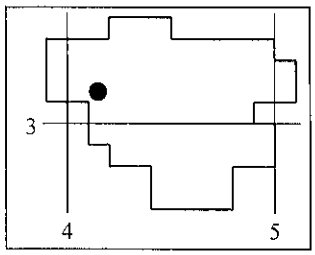
Platanthera bifolia. **Lesser butterfly-orchid.**

Ashdown Forest, E. Jenner (Arnold 1887). Probably recorded from the west side of the Forest by F. Parsons (Clark 1903). Near Pippingford, 1904, J. Stirling (**TLS**). Ashdown Forest near Gills Lap, 1911 (Done 1914). Near Pippingford, J. Stirling (Wolley-Dod 1937). Kidbrook Park bog, 1943, eight in 1944, six in 1947; bog to left of Old Lodge, 1944, 1947, 1948; G. Dent (Dent 1928-1953). According to Haes (1977), a few lesser butterfly-orchids can be found by the sharp-eyed in June in the area between Chelwood Beacon and Londonderry Farm. Tetrad 42T (Hall 1980).

More traditionally a heathland plant than *P. chlorantha,* it often benefited from some shade under grazed bracken (Tubbs 1986), but sometimes also found in deep calcareous woodland (e.g. in Kent, D. Lang, pers. comm. 1995). It has not been recorded from East Sussex recently, but has been seen in at least three West Sussex sites.

It is commoner in the north and west of the British Isles, but is decreasing in England (Rich & Woodruff 1996). It occurs in Europe, Asia and North Africa but is rarer near the Mediterranean. Although it usually has two leaves as implied from the name, at its northern limit in Russia 95% of the plants apparently have only one leaf!

Anacamptis pyramidalis. **Pyramidal orchid.**



Rather surprisingly, one plant in Churlwood car park (417.310), 1991, CM, and it reappeared in 1995. The plant occurred on the top of the bank surrounding the hard parking area, pH 7.2, which had been surfaced with old limestone railway ballast, pH 8.0, which accounted for the high soil pH.

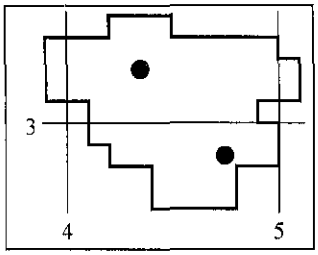
It appears currently to be having a resurgence on the chalk in Sussex, with plants often appearing on new road verges. It is widespread on the Downs and on calcareous soils in southern England, and is rarer in the north. It occurs in western, central and southern Europe, and in North Africa.

Pseudorchis albida. **Small-white orchid.**

Ashdown Forest, 1893, K. Dixon (**BTN**). On Ashdown Forest near Nutley Mill, 1839, J. Woods (**BM**). Near Nutley, 1841, W. Borrer (possibly the specimen in **BTN**). Rediscovered by J. Edwards in 1862 and frequently seen by E. H. Farr and others, but often does not flower; wood above Hartfield, Miss E. M. Holmes; two specimens from Forest Row, 1935, F. F. Wood were regarded as "unreliable" (Wolley-Dod 1937). A specimen collected by J. Edwards in 1867 is labelled "near Nutley Windmill. The only plant seen, tuber undisturbed" (**BTN**). Between Fairwarp and Nutley, 1893, E. H. Farr. A note in G. Dent's diary from a letter from E. M. W. 1935 "The little white orchid is to be found at Nutley in a meadow belonging to Grover the Butchers; it is behind his house and you have to ask permission to get it. Grover's shop is in the main street. Via 'Jane' of Nutley". A single sterile orchid plant, which was probably this species with the right tubers and leaves, was seen by FR in grass heath south of Chuck Hatch in the 1940s.

This and other sites in Sussex have been searched since without success, and it is presumed extinct (Hall 1980). They are the only sites in south-east England and the nearest sites are now probably in Wales. It is locally distributed in Scotland, and occurs widely in northern temperate regions of the world.

***Gymnadenia conopsea*. Fragrant orchid.**



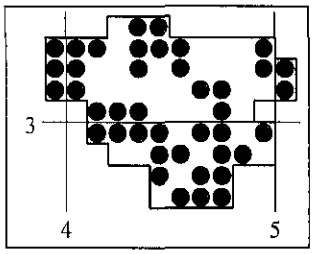
On Ashdown Forest, near High Beeches and Gills Lap (Coleman 1836). Common on the Forests, E. Jenner (Arnold 1887). Nutley, 1842, W. Borrer; sparingly on the Forest near Poundgate, TWNH; St John's Church, Crowborough, E. D. Morgan (Wolley-Dod 1937). Tetrad 43L (Hall 1980), not refound, and possibly an error for the Ashdown Forest Visitor Centre site. Single spike on north road verge between Friends Car park and Beech Hill, 1986, R. Tallack. Single spike in Ellison's pond car park, 1993, C. Weaver.

We have two sites, near Ashdown Forest Visitor Centre (438.325), which amazingly equates to Coleman's site near High Beeches - 12 spikes were reported in 1988 and 1989, 20 in 1991 and 15 in 1992, AFRR and 17 spikes in 1993, CM & NM; road verge by the Radio Mast (472.288), pH 7.5, 1993, NM, two spikes 1994, three but all damaged and no fruit set 1995, TR.

Plants on heathy soils on a ride near the Visitor Centre are subsp. *borealis*, and plants on the verge near the radio mast are subsp. *conopsea*, possibly imported with chalk used to make the road. Subsp. *conopsea* is probably the commonest subspecies in the south of the British Isles where it is widespread on chalk and limestone, but may be the least common in Europe as a whole. Subsp. *borealis* has also recently been found in Sussex growing on the chalk - it is more northern in Britain but appears quite widespread in Europe as a whole, occurring south to the Dordogne.

Fragrant orchids are quite widespread in Sussex on the chalk, rare in the Weald, and widespread in Europe and Asia.

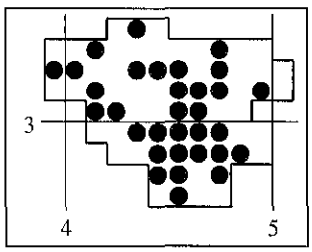
***Dactylorhiza fuchsii*. Common spotted-orchid.**



Common as found by Hall (1980), with plants on the richer soils on road sides, meadows and light woodland, but definitely avoiding the more acidic poor soils. Spreading well in rockery at Oldlands Hall, 1995. About 30 plants rescued and transplanted in large clods of earth by B. Hoath in the early 1980s from the Crowborough Hospital Day Centre building site to the grassland at Fairwarp Village Hall. They are not mown until they have set fruit and are spreading into the adjacent grassland, but the rabbits nip the heads off in acts of sheer vandalism.

Common in Sussex and lowland Britain. Widespread in Europe but rarer in the south.

***Dactylorhiza maculata*. Heath spotted-orchid.**

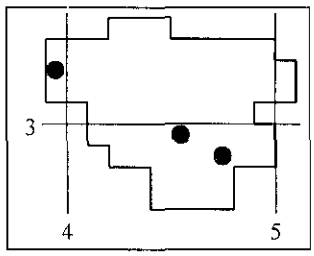


Frequent (Hall 1980).

This orchid occurs scattered through the damper heathland areas on poor soils and in wet flushes. It usually occurs as groups of a few individuals, but occasionally there are large patches (e.g. the superb stands at Brown's Brook). One wonders if these were the wild orchids responsible for scenting the air at Herons Ghyll during the war (Pinks 1945).

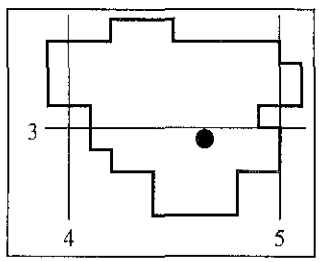
Ashdown Forest is the main headquarters for this orchid in Sussex where it is occasional on acidic and heathy soils. It is widespread in Britain, especially in the north and west. It is widespread in Europe except for the south-east.

***Dactylorhiza fuchsii* - *maculata* intermediates.**



Plants morphologically intermediate between the parents were found in at least three populations where the parents grow together, and are provisionally ascribed to the hybrid *D.* × *transiens* but they have not been verified or checked for sterility. It appears to be a rare hybrid in Sussex and has probably been over-recorded in Britain.

***Dactylorhiza incarnata* (*Orchis latifolia*). Early marsh-orchid.**



Pippingford bog, 1904, J. Stirling (**TLS**). Ashdown Forest (Done 1914).

Recorded south of Old Lodge (46.29) in a lovely flush with *Cirsium dissectum, Eriophorum angustifolium* and *Narthecium* (465.303), and confirmed as the mauve subsp. *pulchella* by David Lang. *Dactylorhiza* plants were recorded at this site as *D. praetermissa* by G. Dent in 1944 and 1947 (Dent 1928-1953). It appears to have been refound by J. Gascoigne, when there were 70+ spikes (*AFN* 9: 3-4). 30+ spikes were counted in 1986, 1987 and 1988, AFRR, 31 spikes 1991, 30 in 1993, NM, 17 in 1994, TR. A second population occurs 200 metres to the east with two plants in 1992, three in 1993, NM.

A rare plant in Sussex, with one other site for subsp. *pulchella* and two for the pink-flowered subsp. *incarnata*. It is scattered throughout Britain, especially near the coasts.

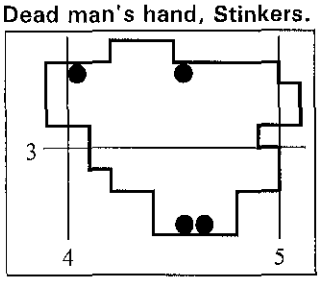
Widespread in Europe, but rare in the south.

***Dactylorhiza praetermissa*. Southern marsh-orchid.**

Ashdown Forest in TQ/4.3, c. 1955, R. A. Boniface. Tetrad 43L (Hall 1980).

Not refound in this area (the record in *AFN* 9: 3-4 refers to *D. incarnata*), but scattered around in Sussex on a range of soils and it could reappear on the Forest. It is widespread in southern England and Wales. It is endemic to north-west Europe.

***Orchis mascula*. Early purple-orchid, Long purples, Ram's horn** (sometimes also used for *O. morio*)**, Dead men's fingers, Dead man's hand, Stinkers.**



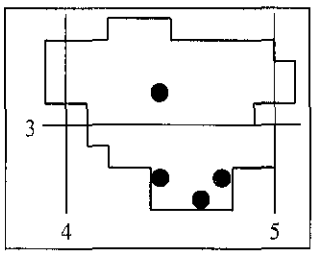
Tetrads 42N and 42T (Hall 1980) and refound in both.

Abundant in copse near Mudbrooks House (403.339), pH 6.3, 1995, TR & PA; roadsides and woodland at Toll Lane (458.263), pH 5.9, four spikes in 1988, CM and still there with many vegetative plants too, 1995, TR & JK; Toll Lane coppice (461.263) where it has been known for some time (*AFN* 9: 3-4) - two plants in 1989, 120 plants in 1990 and 30+ plants in 1991, and still present in 1993-1995; two plants on hedgebank, near Coleman's Hatch (456.338), 1995, TR; transplanted to Fairwarp Village Hall, B. Hoath, and surviving well (466.264). In all cases it grows on the richer clay soils, and avoids the acidic heathy soils.

The name 'stinkers' comes from the tom-cat smell of the flowers after fertilisation or at night after it has been picked, so they are best left in the countryside where they can be appreciated.

Frequent to locally common in Sussex. Widespread in Britain, sometimes at quite high altitudes in the mountains, but decreasing in England (Rich & Woodruff 1996). It is recorded in much of Europe, Asia and North Africa.

***Orchis morio*. Green-winged orchid.**



Nutley Place, 1948; meadow near Garde, few in 1941, four in 1944, three in 1945, present in 1947; G. Dent (Dent 1928-1953). Old Lodge (457.299), on the right part of the bank between the lawns in the 1960s, but gone by 1990, S. Stewart, possibly the tetrad 42P record in Hall (1980).

We had no records until 1995 when we thought we should ask the locals: six plants on lawn at Windyridge (440.319), 1995, S. Stewart - the numbers vary from year to year and they are protected with cages as the deer are rather partial to them; one plant in Fairwarp churchyard (465.268), pH 6.3, 1995, PD, only two florets left after the mower; 12 plants on steep herb-rich grassy grass bank, Nutley Hall (44.27), 1993, PS - the plants are carefully looked after and the bank is not mown until mid-summer (this is presumably Dent's site); small purple orchids on the lawns at Oldlands Hall (475.275) seen regularly by R. Barley are assumed to be this.

Detailed population studies by Terry Wells in Cambridgeshire (pers. comm. 1995) have shown that this is a perennial which can flower many times. 11 out of 23 plants studied have lived for at least 18 years though individual plants can lie dormant so they may not be visible every year. Some plants ten years old have not yet flowered, and two plants have flowered nearly every year - it is clearly not monocarpic as is often reported.

It usually occurs in old grassland but is increasingly becoming restricted to lawns, churchyards and nature reserves due to agricultural improvements. It is most often seen in churchyards in Sussex now, having declined dramatically since Coleman (1836) recorded it as common in meadows around East Grinstead. Stewart, Pearman & Preston (1994) give a current national distribution map showing it occurs in southern Britain, and is decreasing in England (Rich & Woodruff 1996). It is widely recorded in Europe and Western Asia.

THE BOTANISTS

David Bevan (1940-). David's interest in botany started at the age of eight when his father showed him *Wahlenbergia* near Horsted Keynes, where it still grows. He lives in London where he is Conservation Officer for the Borough of Haringey, a past President of the London Natural History Society, on the Council of the London Wildlife Trust, a Branch Secretary for the Wild Flower Society, runs Railway Fields Nature Reserve and lectures on natural history and conservation. He shares a cottage at Twyford, and finds botanizing on Ashdown Forest the perfect antidote to the stresses of urban life.

C. Patrick J. Coulcher (1937-). Patrick was educated at Eastbourne College where his interest in botany and general natural history developed. He became a fighter pilot, having graduated from the RAF College at Cranwell in 1957 where he won the United Services Institute award for his thesis 'The Breeding of British Birds'. Botanical interests took second place until he retired to Eastbourne in 1992, and was then able to devote most of his time to natural history. He is a member of the BSBI and the SBRS, and gives illustrated talks on various aspects of natural history to raise money for charity. He has attended many recording meetings for the flora.

Patricia Donovan (1928-). Pat was born and brought up in Sanderstead, Surrey. She went to Wimbledon Art School, and after a spell working in an architect's drawing office she married and has lived in Buxted for 40 years. Since then she has combined a talent for drawing with a special interest in plants, and has illustrated a number of books including this flora. She recorded for the *Sussex Plant Atlas* and was first christened into the Ashdown Forest flora in 1968 when departing from a field meeting of the Sussex Flora Committee she leapt over a stream, missed her footing and fell backwards into it. She especially enjoys going to new places, the flora of churchyards and hunting for particular missing species such as *Leontodon*. She is Field Meetings convenor for East Sussex for the SBRS.

Paul A. Harmes (1952-). Paul was born in Shoreham-by-Sea, West Sussex, and spent his early years on the move as his father was in the Royal Sussex Regiment. As a child he explored the Downs, gradually becoming interested in wild flowers. He went to Knoll Secondary School in Hove, then joined Seeboard as a cartographic draughtsman, moving 16 years later to his current post of Engineering Services Officer with the National Grid Company. Botany became an obsession and in 1992 he succeeded Breda Burt as BSBI Vice-county Recorder for East Sussex. His main contribution has been to answer very patiently numerous queries about records, to store mountains of specimens and the record cards, and to do some recording but not as much as he would have liked as the rest of East Sussex also needs some attention!

Alan G. Knapp (1947-). Alan was born and brought up in south-east London, but his father's family came from the Ticehurst area in East Sussex. He became interested in natural history when he joined Phillips Research Laboratories in 1973, moved to Crawley, and found plants easier to photograph than birds and butterflies. He met Arthur Hoare through the Sussex Wildlife Trust and was introduced to the SBRS. His main contribution to the flora has been recording, especially on the west side most easily reached in an evening from Crawley, and helping with the computing and analysis of the data. The most enjoyable part of the project (apart from contributing to the almost impossible task of keeping Tim busy!) has been the unexpected discoveries and visits to new parts of the Forest.

Chris Marrable (1953-). Chris was born in Manchester but was soon moved to rural Cheshire. He studied agriculture in Shropshire and then worked for ICI counting red spider mites in East Anglian orchards, mildew infections on barley in Wiltshire, and measuring grass heights on RAF Benson in Oxfordshire. He escaped to become a ranger on a lowland heath adjacent to the Dee Estuary on the Wirral, and moved south again to become an Ashdown Forest Ranger in 1983. He believes the flora has two great benefits - the joy of rediscovering lost plants and drawing together all the diverse bits of knowledge to get them safely recorded forever. In 1996 he married Nicky Muggeridge.

Malcolm McFarlane (1935-). Malcolm was born and brought up in Tunbridge Wells. He has had a lifelong interest in wild flowers having had 'Flower Fairy' books as a small child, and enjoyed botanizing on Ashdown Forest. This led to a degree in Botany at Cambridge, then teaching in southern England and Nigeria, finally working for the Education Department of East Sussex County Council until retiring in 1989. He lived at Buxted from 1983, and moved to Blackboys in 1994. He has been especially involved with recording for the flora and is seldom happier than when listing plants, but also enjoyed the research into historical records. He is good at falling in bogs on Ashdown Forest, and is also interested in bryophytes.

Nicola J. Muggeridge (1968-). Nicky has lived around Ashdown Forest since the age of 13 at Forest Row and more recently Maresfield. Whilst a schoolgirl, she spent all her spare time out on the Forest on foot or horseback ("revising" as she called it then). She studied natural sciences at Cambridge specialising in zoology. During the holidays and after leaving University she worked as a voluntary assistant to the Rangers on the Forest, developing an interest in all aspects of natural history and environmental education; she surveyed chalk grassland for English Nature, then mapped the Forest and set up the Forest database. Now a professional ecologist, Nicky still walks the Forest every day, is a member of the Ashdown Forest Riding Association and the Conservation Group, as well as being an Information volunteer. Besides assisting with recording and data input, her knowledge of the Forest has been most helpful. She feels the best thing about doing the flora is the opportunity to learn from *real* botanists.

Rachel A. Nicholson (1934-). Rachel has been interested in wild flowers since her youth. She trained and worked in horticulture for six years, including two years at the Royal Botanic Gardens at Kew, where an interest in native plants was encouraged by the Botany Club. She was introduced to Sussex in the mid 1950s when her parents moved from Cheshire to retire at Five Ashes, Mayfield; on retirement in 1991 she settled in the same house. Now, after a break of thirty years accompanying her husband and bringing up a family in Tanzania and Nigeria where she became involved with fungi and a quite different flora, she is getting back into British plants via the flora and as a member of the SBRS. Her main contribution to the flora has been recording, enjoying being out on the wide open spaces in the Forest, quite a contrast to the deep lanes and lovely ancient countryside of the Mayfield area. On field meetings she often disappears into the deepest thickets, emerging with a few extra species not seen by the faint-hearted amongst us! She also abstracted Phyllis Stockdale's herbarium in Bexhill Museum.

Helen Proctor (1948-). Helen was born and brought up in Orpington, Kent, moved to Hailsham in 1976 and works for East Sussex County Council. She has had a lifelong interest in plants, ecology and wildlife gardening, and is a keen plant photographer taking pictures to illustrate talks. She is a member of the Sussex Wildlife Trust and SBRS, and has helped with recording for the flora joining us on many meetings.

Madeline E. Reader (1926-). Madeline was brought up near Dorking, Surrey, and her parents' delight in the chalk flora encouraged an early interest in wild flowers. This was renewed on returning to Sussex in the 1950s, where she joined the SBRS. Whilst working as an assistant at the Ashdown Forest Visitor Centre, the need for detailed knowledge on every subject under the sun was essential. In the early 1980s an attempt by local volunteers to record the plants of Ashdown Forest failed, so she was delighted to join in the new scheme. Her main contribution (with her husband Pete) has been abstracting and compiling historical information from numerous floras, which gave her a fascinating insight into the plants no longer on the Forest, and into the random recording done in the past. Her local knowledge of what has happened through the years has also been invaluable, and any time Tim has a query, guess whose phone rings?

Peter J. Reader (1924-). Pete has lived in the Forest area all his life, first at Upper Hartfield and now at Horney Common. He has been a voluntary Ashdown Forest ranger since 1980. An interest in bird watching became frustrated with blunted hearing and sight, so he found static and silent plant life more rewarding. He has long been interested in photography and has a collection of old pictures showing how much the Forest has changed. With Madeline, he has spent many hours researching the old floras.

Elizabeth J. Rich (1936-). Elizabeth was born in Five Ashes and still lives there, her family having lived in Sussex since the 17th century. She went to schools in Sussex and Northumberland, her mother's home with which she has maintained strong links, and has also lived in London. A country upbringing ensured that an interest in wild flowers was never forgotten. She joined the Sussex Naturalist's Trust (now the Sussex Wildlife Trust) in 1966, and recorded for the *Sussex Plant Atlas*. She served on the BSBI Meetings Committee for about 20 years, and was also Minuting Secretary to BSBI Council from 1983-1992. Her hobbies include reading, painting and walking, and she has especially enjoyed recording the plants on Ashdown Forest as her contribution to this flora.

Timothy C. G. Rich (1961-). Tim (no relation to ER!) was born and brought up at Stedham in West Sussex. He went to Midhurst Grammar School and became interested in plant taxonomy during the sixth form. He took a degree in Ecology at Lancaster, and became a fanatical botanist especially interested in Crucifers. He was introduced to the SBRS by Pat Donovan in 1981. After his Ph.D. at Leicester on phototropism, he ran the BSBI Monitoring Scheme, and then briefly returned to Lancaster as the first Research Associate in the Unit of Vegetation Science. In 1992 he became self-employed, and moved to Forest Row in 1993. His contribution to the flora has been organising (bullying, the others call it), writing and recording, and he enjoys the latter more than anything. He is very interested in the problems of recording plants and interpreting the data gathered.

Phyllis H. White (1925-) and **Raymond G. M. White (1926-1989).** Phyl was brought up in London, but two years in Devon as a wartime evacuee started her interest in the countryside. She became a keen rambler which brought her together with Ray, who she married in 1951. Phyl was a quantity surveyor, and Ray sales director in a hospital equipment firm. They moved to Hertfordshire in 1955 and natural history became a family pursuit, particularly fungi. In 1967 they moved to Kent and joined the recording for the *Atlas of the Kent flora*, by which time a few outings with John and Chris Dony had them hooked completely on plant recording. In 1987 they recorded TQ/4.3 for the BSBI Monitoring Scheme including part of Ashdown Forest. After Ray died Phyl moved to Warlingham, Surrey and joined the SBRS through Breda Burt. Having already taken a close interest in Ashdown Forest and its plants, she was very happy to take part in another survey. She has also helped collate records.

GLOSSARY

achene: a small, indehiscent fruit
calcicole: more frequently found on or confined to soils with a high or alkaline pH (pH > 6.7)
calcifuge: more frequently found on or confined to soils with a low or acidic pH (pH < 4.5)
caruncle: an small out-growth on a seed
chlorosis: a disorder or disease of plants where yellowish-white patches form on leaves due to lack of chlorophyll
cleistogamous: flowers which never open and are self-pollinated
critical species: a species which is difficult to identify
cytotype: popuiations differing in chromosome number or chromosome morphology
dioecious: having the sexes on different plants
diploid: having two sets of chromosomes
ecotype: a form adapted to particular ecological conditions
eutrophic: rich in nutrients
genotype: the full genetic constitution of a plant
gley: a water-logged clayey soil
hexaploid: having six sets of chromosomes
introgression: repeated back-crossing of a hybrid to one or other parent, the hybrid products coming to resemble that parent after a few generations but with some characters from the other parent
mesophilous: liking conditions neither acidic nor alkaline
microclimate: the climate immediately around the plant
monoecious: having unisexual flowers, with both sexes present on the same plant
mycorrhiza: the association of a fungus with roots of plants
nitrophile: more frequently found on or confined to soils with high nutrient conditions
oligotrophic: poor in nutrients
patent: spreading at approximately right angles
phenotype: the plant as developed under particular ecological conditions
podzol: acidic soils with a leached upper layer and a lower impervious layer formed by deposition of iron (iron pan)
polymorphic: having many forms
polyploid: having many sets of chromosomes
pulvinus: a swelling at the base or top of a leaf stalk
self-compatible: capable of self-fertilisation
self-incompatible: incapable of self-fertilisation
taxon (plural, **taxa**): any taxonomic grouping, such as a species, or a genus, etc.
tetrad: a 2-km X 2-km square on an Ordnance Survey map used as a unit for recording
tetraploid: having four sets of chromosomes
trigonous: three-angled

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GAZETTEER

This gazetteer has been compiled from the 1:25,000 Ordnance Survey map and the *Map and Guide to Ashdown Forest* (1993 edition) available from the Forest Centre which gives the car park names and locations.

Localities are given grid references to the 1-km square in which they occur, and thus provide a means of finding the localities cited in the text; they will not necessarily indicate the location of the plants.

Airman's Grave	45.27
Ashdown Forest Centre	43.32
Ashdown Forest Gardens	46.28
Ashdown Forest Riding Centre	46.28
Ashdown Park	43.32
Balcombe Farm	39.31
Bank Cottage	43.33
Barnsden	47.28
Barnsgate	48.28
Barnsgate Lodge	48.28
Bartons	49.28
Beacon Wood	42.29
Beaconwood Farm	42.29
Beech Hill	45.28
Beeches car park	40.31
Birch Grove House	41.30
Birch Wood	45.31
Birchfield Farm	49.29
Black Hill	47.30
Black Hill car park	47.30
Boringwheel Mill Farm	45.26
Box car park	45.28
Braberry Hatch	42.29
Brambletye	41.35
Broadstone car park	43.32
Broadstone Farm	43.32, 43.33
Broadstone Warren	42.32, 43.32
Broadstone Warren Scout Camp	42.32
Broom Farm	49.28
Broomhill	49.28
Brown Knoll	48.29
Brown's Brook	47.27
Buckhurst Farm	48.33
Bunker's Hill	49.31
Bushy Willows car park	47.30
Cackle Street	45.26
Camp Hill	46.28
Campfields Rough	47.28
Centre car park	43.32
Chantersell	44.27
Chapelwood Manor	43.28
Chelwood Beacon	42.29
Chelwood Corner	42.28
Chelwood Farm	42.28
Chelwood Gate	41.30
Chelwood Vachery	43.30
Chelworth	41.29
Chestnut Farm	45.27
Chuck Hatch	47.33
Church Hill	49.32
Church Hill car park	49.32
Churlwood car park	41.31
Claygate Farm	47.26
Cobbers Farm	46.31
Coldharbour Manor	39.32
Coleman's Hatch	44.33, 45.33
Cophall Farm	46.26
Court House	44.28
Cow Field	49.31
Crabtree Farm	48.29
Crest Farm	47.28
Cripps Manor	39.31
Crowborough Golf Course	49.28
Crowborough Training Camp	49.29
Crowborough Warren	50.30
Dalingridge Farm	39.32
Deerswood Farm	47.30
Dodd's Bank	45.26
Dodd's Bottom	45.26
Dodd's Hill	44.27
Dovecot Farm	43.29
Dovedale Farm	50.32
Duddleswell	46.27
Duddleswell car park	46.27
Duddleswell Manor	46.28
Dumpey's car park	44.32
East Wood	44.30
Eighteen Acre Wood	42.32
Ellison's Pond car park	46.28
End House	44.32
Fagot Stack Corner	48.32
Fairwarp	46.26, 47.26
Fairwarp Farm	47.26
Fernhill	40.33
Fincham Farm	46.33
Fishers Gate	49.33
Five Hundred Acre Wood	48.32, etc.
Five Hundred Rough	47.32
Ford's Bank	46.26
Ford's Green	44.27
Forest Lodge	45.26
Forest Lodge Farm	49.32
Forest Row	42.34, 43.34
Four Counties car park	46.31
Foxbury Wood	43.33
Friar's Gate	49.33
Friends car park	45.28
Funnell's Farm	44.26
Furnace Farm	45.32
Furnace Wood	47.26
Garde	42.31
Gatehouse Farm	44.33
Gills Lap	46.31
Gills Lap car park	46.31
Gills Lap North car park	46.31
Goat car park	40.32
Goat Farm	40.32
Gorsey Down car park	47.28
Great Birch Wood	45.27
Green Wood Gate	48.30
Greenhall Cottage	42.33
Greenwood Gate Clump	47.31
Half Moon Copse	42.31

Smockfarthing	40.31
Smuggler's car park	47.29
South Hartfield House	45.33
South Lodge	42.34
Southbank Wood	43.31
Spikey Brown's Cottage	42.32
Spring Farm	46.32
Spring Garden	46.27
Spring Garden Wood	46.26
St John's	50.31
St Richard's car park	43.32
Stone Cottage	44.32
Stonehill car park	45.28
Stonehouse Farm	43.34
Stonemead	43.28
Streeter's Rough	42.29
Streeters Farm	46.28
Summerford	46.26
Sunting's	46.32
Suttons Farm	40.31
The Birches	44.33
The Crow's Nest	47.28
The Farm	39.32
The Nursery	48.30
The Park	44.32
The Ridge, Chelwood Gate	41.29
The Ridge, Coleman's Hatch	45.32
The Rough	46.32
The White House	41.30
Tile Barn Farm	47.33
Tile Lodge	46.31
Toll Lane	46.26
Tompset's Bank	42.33
Townsend's car park	44.32
Trees car park	43.30
Triangle Wood	44.31
Twyford car park	40.32
Twyford Farm	39.31
Upper Misbourne Farm	45.27
Upper Parrock Farm	44.34
Vachery car park	43.30
Warren car park	41.32
Water Farm	44.33
Water Holes car park	47.29
West Wood	43.30
Windyridge	43.32
Wood Eaves	48.31
Wood Reeves car park	47.31
Woodcock Farm	44.26
Wren's Warren	47.32
Wren's Warren car park	47.32
Wych Cross	41.32
Wych Cross Fruit Farm	42.31
Wych Cross Place	41.31
Wych Cross Place Farm	40.31
Wych Warren	42.33
Yew (trees)	47.28
Yew Tree Farm	44.27
Yew Tree Hall	43.33

SUSSEX BOTANICAL RECORDING SOCIETY

GRID REFERENCE (SW CORNER): TQ 47 – 33 –
Tetrad Letter: R

E	J	P	U	Z
D	I	N	T	Y
C	H	M	S	X
B	G	L	R	W
A	F	K	Q	V

DOES THE GRID REFERENCE REFER TO 10KM / 5KM / TETRAD / (1KM) / 6 FIG / SITE

LOCALITY - PLEASE GIVE PLACE NAMES ON OS MAP FROM WITHIN AREA RECORDED OR CLOSEST TO IT.
Chuck Hatch

HABITATS RECORDED:

Wood (nat.)	✓	Park/Ch.yard		Disturbed/ Waste Ground	
Plantation		Railway		Urban inc Gdn.	
Scrub	✓	Marsh		Shingle Beach	
Hedgerow	✓	Pond/Lake		Cliffs	
Heath	✓	Stream/River	✓	Dunes	
Grassland		Rock/wall		Salt Marsh	
Road Verge	✓	Arable		Other(specify)	

DATE(S) OF VISIT(S): 17-9-1992

VICE COUNTY (13 = West Sussex, 14 = East Sussex): 14

ROUTE TAKEN WHILST RECORDING:
477.335 up road to Chuck Hatch common (473.331) and searched grazed area

COVERAGE		QUALITY OF AREA RECORDED:	
±comprehensive	✓	Outstanding	
good		Good	
partial/incomplete		Average	✓
selected/misc		Poor	

RECORDER(S) - PLEASE GIVE YOUR OWN, FULL INITIALS: T.C.G.Rich

HOURS SPENT RECORDING: 1-5 hours

FOR LESS COMMON, NOTABLE AND CRITICAL SPECIES NOT INCLUDED OVERLEAF AND SPECIES MARKED +

SPECIES	LOCALITY	6 FIG GRID REF	HABITAT	OTHER DETAILS	SPECIES	LOCALITY	6 FIG GRID REF	HABITAT	OTHER DETAILS
Hieracium sabaudum	Chuck Hatch	473.331	wood edge						
Euphrasia nemorosa	"	473.331	grazed grassland						
Hieracium umbellatum	"	473.331	healthy open area	locally frequent					

APPENDIX 1. EXAMPLE OF COMPLETED RECORD CARD.

Asple adi+ 185
rut 192
tri 204
~~Athyr fil~~ 211
Azoll fil 223
~~Blech spi~~ 244
Ceter off 473
Dryop aem 660
aff 662
car 666
~~dil~~ 661
~~fil~~ 665
Equis arv 712
flu 713
pal 717
tel 721
Ophio vul 1381
Oreop lim 2051
Phyll sco 1466
Polyp agg 1544
vul 15442
Polys acu 1546
set 1548
~~Pteri aqu~~ 1619

Acer cam 3
pla 4
pse 5
~~Achil mil~~ 7
~~pta~~ 9
Acino arv 12
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* = Aggregate. ssp. = Subspecies. x = Hybrid. f = forma. + - Indicates that more information is required for these species.

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