SID VALLEY BIODIVERSITY GROUP

SID VALLEY FLOWER SURVEY 2021

The SVA's Knapp Meadow

Cinnabar caterpillars (*Tyria jacobaeae*) on Ragwort (*Jacobaea vulgaris*)

Sid Valley Flower Survey 2021

Summary Report by Ed Dolphin

"What a lonely place it would be to have a world without a wildflower!"
Roland R Kemler

Buff-tailed Bumblebee (*Bombus terrestris*) visiting Foxgloves (*Digitalis purpurea)* on Salcombe Hill.

I would like to say a huge thank you to all the volunteers who gave their time collecting the data.

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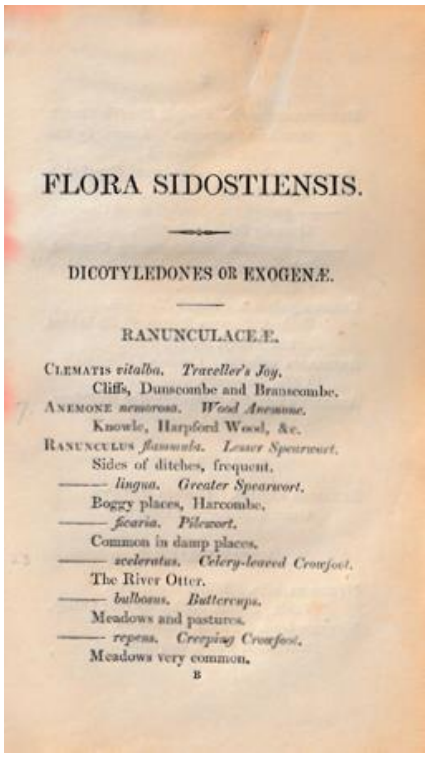
INTRODUCTION

In 2021, the Sid Valley Biodiversity Group carried out a year-long survey of the valley's herbaceous plants, recording what was in flower from month to month. This was a citizen scientist project with volunteers from the group noting which flowers they saw when out walking around the town and in the countryside. This was not totally random, apart from casual walks, a number of sites around the valley were selected for regular survey to represent a range of habitats including the beach, hedges, heathland, and open grassland. The sites were selected to cover the valley from north to south and east to west (Appendix 1).

The observations were logged into the iNaturalist international database, either directly through a phone app out on the walk, or back home on a computer or tablet. The distribution of observations can be displayed in various formats including on an interactive map (Appendix 2). The iNaturalist system allows the observations to be sorted by month, location, or species, it also allows for a degree of validation for the observations which is important as the group were all amateurs.



FLORA SIDOSTIENSIS.

DICOTYLEDONES OR EXOGENÆ.

RANUNCULACEÆ.

CLEMATIS *vitalba*. *Traveller's Joy.*
Cliffs, Dunscombe and Branscombe.
ANEMONE *nemorosa*. *Wood Anemone.*
Knowle, Harpford Wood, &c.
RANUNCULUS *flammula*. *Lesser Spearwort.*
Sides of ditches, frequent.
—— *lingua*. *Greater Spearwort.*
Boggy places, Harcombe.
—— *ficaria*. *Pilewort.*
Common in damp places.
—— *sceleratus*. *Celery-leaved Crowfoot.*
The River Otter.
—— *bulbosus*. *Buttercups.*
Meadows and pastures.
—— *repens*. *Creeping Crowfoot.*
Meadows very common.
B

The 2021 survey was not the first time the valley's wild flowers have been catalogued. In 1849, local doctor W.H. Cullen published the most comprehensive species list in his book *Flora Sidostiensis or a Catalogue of the Plants Indigenous to the Vicinity of Sidmouth* which listed 656 species. These included woody species and non-flowering plants such as ferns, these have not been included in this year's survey. Also, the group had difficulty identifying many of the grasses, sedges, and rushes down to species. Cullen listed 17 sedges, but the 2021 study has listed only three. The group will be looking for the other 14 in 2022, along with the valley's grasses and rushes, with expert help hopefully.

Excluding the woody species, rushes, sedges and grasses, Cullen listed 489 species of herbaceous flowering plants. The 2021 survey recorded 404 species (Appendix 3), 381 if the rushes, sedges, and grasses are excluded. It is difficult to establish how many of these correspond to Cullen's finds because of inconsistency in names across 170 years. Having cross-referenced the lists, we believe that the 381 species in the 2021 survey includes 247 species known to be in the valley according to Cullen and 134 that he did not record. Several of these are not truly wild but recent garden escapes which Cullen could not have found. These have been included because Cullen did list garden escapes if they were established in the wild. Also, there are some species, for example White Campion (*Silene latifolia*), that are only here because they have been introduced recently into artificial 'wild flower meadows' as a constituent of commercial seed mixes and turf.

The 2021 list is not a complete record for the valley, volunteers were still finding new species into November and some areas of the northern part of the valley escaped survey for logistical reasons such as lack of access. Another reason for the missing species is that Cullen explored beyond the Sid valley and some of his records are listed from sites such as the ancient broadleaf woodland of

Harpford Woods and the salt marsh at the mouth of the Otter, habitats that are not replicated in the Sid Valley search area. Follow up surveys are planned for 2022 and beyond. Along with grasses, etc. the volunteers will attempt to locate the species from Cullen's list not found in 2021.

appellation of the garden of England. In the study of the many plants wild and native, as well as cultivated and exotic, which flourish in Sidmouth, the botanist will find his time pass quickly, for his hands will be full; it will be long ere he weep the tears of the Macedonian, or exclaim 'Othello's occupation's gone.'

An alphabetical arrangement of some of the phœnogamous or flower bearing plants, indigenous to the place, will be all that our limits will allow. The following are the principal.—

Theodore Mogridge A Descriptive Sketch of Sidmouth 1836

BOTANIC NAME.	ENGLISH NAME.	WHERE FOUND.	
Achilléa millefolium	Milfoil or Yarrow	Pastures, frequent	*p.*
Adoxa moschatellina	Tuberous Moschatel	Hedges	*p.*
Agrimonia Eupatoria	Agrimony	Fields and Hedges	*p.*
Agrostemma Githago	Corn Cockle	Corn-fields	*a.*
Ajuga reptans	Bugle	Meadows	*p.*
Alchemilla vulgaris	Ladies Mantle	Meadows	*s.*
Alisma plantago	Great Water Plantain	River bank	*p.*
Allium vineale	Crow Garlick	Meadows, frequent	*p.*
Anagallis arvensis	Pimpernel	Cultivated land	*a.*
——— tenella	Bog Pimpernel	Bog on Salcombe Heath	*p.*
Anchusa sempervirens	Alkanet	Hedges on road sides	*p.*
Anemone nemorosa	Wood Anemone	Harpford Wood	*p.*
Anthemis nobilis	Common Chamomile	Salcombe Heath	*p.*
Anthyllis vulneraria	Kidney Vetch	Dry Pastures	*p.*
Antirrhinum majus	Great Snapdragon	Old Walls	*p.*
——— Orontium	Least Snapdragon	Corn-fields	*a.*

Cullen was not the only amateur botanist in Victorian Sidmouth. Theodore Mogridge's *A Descriptive Sketch of Sidmouth* (1836) extolled the mild climate of the valley and included several pages on the Botany, Marine Botany and Conchology to be found here. He did not have room to list all of the local wild flowers, but he does include more than 200. In addition to the flowering plants, Mogridge lists 21 species of Fern and more than 100 species of seaweed which might be useful to future Biodiversity Group surveys.

Victorian scholarly eccentric, Peter Orlando Hutchinson recorded plants seen on his regular walks around the district and these were listed in his own *Flora Sidastiensis* which was issued as an appendix to the 1865 third edition of his *Guide to Sidmouth*.

Hutchinson's list aroused the curiosity of local naturalist Bob Hodgson in the early 1980s. Bob was another of Sidmouth's remarkable citizens and he did a huge amount to support the Sid Vale Association and the Devon Trust for Nature Conservation, the precursor to the Devon Wildlife Trust. I am indebted the Sid Vale Association Museum for finding a copy of Mary Munslow Jones' book about Bob and his survey, *One Man and His Wild Flowers.* Between 1980-83, Bob and one or two friends set out to see how many of the species listed by Hutchinson could still be found. They found 410 species, including ferns, grasses, and rushes. As with the 2021 survey, they found many species not included in the Victorian list. The book has a wealth of information about the valley's flowers in the early 1980s which gives us another stepping-stone in our floral history. Sadly, the book is no longer in print, but a digitised copy can be found on the SVBG website.

Local naturalist Bob Hodgson

Mexican Fleabane *Erigeron karvinskianus*

Many of the herbaceous species from 170 years ago are still with us, plus new species such as the Mexican and Canadian Fleabanes (*Erigeron karvinskianus and E. canadensis*) which

seem to have colonised every wall and pavement in the town since Dr Cullen's time. They are included in the survey because they support local insects and other wildlife.

However, there is no room for complacency. We have a list of species, but we have not made any estimate of abundance for most of them.

Lots of the Victorian species are listed as being found in meadows and pastures and Cullen describes many of the flowers with adjectives such as plentiful, common, abundant, or frequent. There are not many of the grassland species that would attract such adjectives today. We have less than half the grassland that Cullen would have seen, and modern grassland has a very different species make-up with more grass by volume and fewer non-grass species.

The banked hedges that are a Devon speciality are home to many herbaceous flowers. A 2020 survey of local hedgerows by Sidmouth Arboretum revealed that there are now far fewer miles of these important wildlife havens than Cullen would have known. Also, as with the grassland, modern maintenance methods mean the hedgerows that do remain will support fewer wild flowers.

Greater Stitchwort *Stellaria holostea*

This loss of flower abundance is having a knock on effect on wider biodiversity with fewer insects such as butterflies and bees that depend on the flowers, and fewer birds that depend on the insects to feed their young.

PLANT NAMES

Sticky Mouse-Ear *Cerastium glomeratum*

The 2021 list includes some of the wonderful common names given to our wild flowers, gems such as Sticky Mouse-Ear (*Cerastium glomeratum*) and Shaggy Soldier (*Galinsoga quadriradiata*). Comparing plant lists 170 years apart has the problem that common names are not at all consistent, across time and across geographical distribution. Sometimes, it is difficult to be certain that you are equating like with like and referring to the same plant. This is why the 'official' scientific names, in Latin for historical reasons and often in italics for emphasis, are important.

Cullen did not record Sticky Mouse Ear, but he did record Narrow-leaved Chickweed, which turns out to be the same species. Cullen did not record Shaggy Soldier, another introduced species that possibly hadn't arrived in the UK at that time. It is known as Peruvian Daisy in the USA, although it is native to Mexico. Cullen recorded Yellow Weasel's Snout as abundant in most hedges. If you look up Weasel's Snout in a modern key, you are referred to a very rare pink flower, there is no mention of a yellow species. Cullen's Yellow Weasel's Snout is now known as Yellow Archangel.

Shaggy Soldier *Galinsoga quadriradiata*

It is not only common names that cause problems across the time gap. Taxonomy, the scientific naming of species, is constantly developing and formerly accepted names are changed. In Victorian times, botanists compiled plant families by physical similarities largely, particularly the flower and fruit structure because leaf shape was known to be a poor indicator of a close relationship. Modern botanists have access to DNA evidence that shows which species are linked closely enough to be grouped in the same genus and which genera make a family. Consequently, even the scientific names of some of the plants on Cullen's list have changed.

Sticky Mouse-ear was listed by Cullen as Narrow-leaved Chickweed with the Latin name *Cerastium viscosum* which was used until about 1870, *viscosum* translates as sticky. All the *Cerastium* species have narrow leaves and so the name narrow-leaved is not helpful and several are covered in sticky hairs so *viscosum* was not distinctive enough. At some point, botanists decided to rename the plant *Cerastium glomeratum* taking the flowers being clustered in a ball as the distinguishing feature.

Yellow Archangel *Lamiastrum galeobdolon*

Cullen's Yellow Weasel's Snout is listed as *Galeobdolon luteum.* Modern botanists have retained the *Galeobdolon* but moved it as the species into a new genus as *Lamiastrum galeobdolon*. Cullen did find the modern Weasel's Snout in Sidbury, but he refers to it as the Lesser Snapdragon *Antirrhinum orontium* which is now *Misopates orontium*, although it is still called Lesser Snapdragon in the USA. As was said above, it is now quite rare, and it is one of the flowers that was not found in 2021.

FLOWERING SEASONS

One thing that Cullen's Flora Sidostiensis does not tell us is when he found his plants flowering. A remarkable aspect of the 2021 survey was that so many plants were flowering beyond the months listed in text books. With most of the grasses and rushes excluded, the majority of the flowers in the survey are insect pollinated. Flowers are expensive things to make in terms of plant resources, especially when the goal is to attract pollinators. Colourful petals, sugar rich nectar, nutritious pollen, and other features that help attract potential pollinators all require significant energy. In Britain, most insect pollinated species are expected to be flowering between May and August when flying insect populations are at their peak.

There are flowers that open before May because some of our bumblebees and solitary bees, such as the Early Bumblebee (*Bombus pratorum*) and Buff-tailed Bumblebee (*Bombus terrestris*), fly as early as March and, in a mild winter, even earlier. The queen bees over-winter and, if the temperature is above 10°, they will wake and look for food, but they need to shiver their flight muscles to raise their internal temperature to 30° before they can take off. Species such as Sweet Violet (*Viola odorata*) and, Stinking Hellebore (*Helleborus foetidus*) which are then able to make an early start in seed production. Stinking Hellebore has an extra trick, it carries a yeast in its nectar that ferments the sugar with two

Buff-tailed Bumblebee *Bombus terrestris* on Sweet Violet *Viola odorata* 14th March 2021

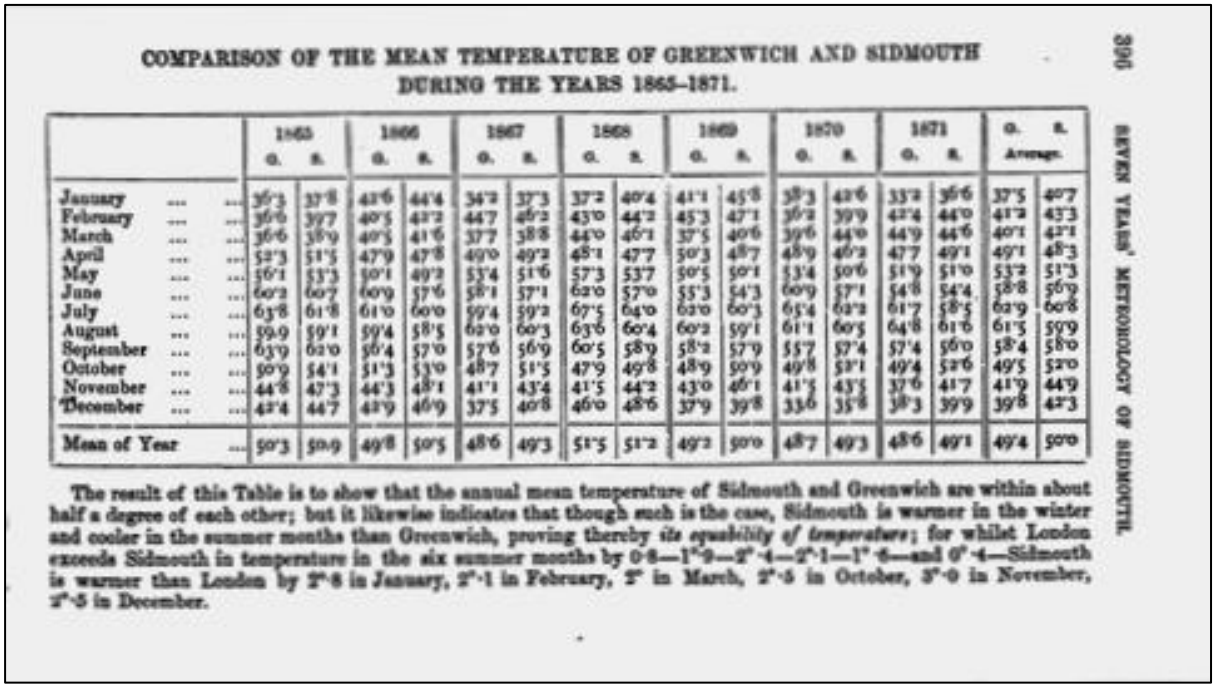
effects that attract pollinators. The fermented sugar turns to alcohol and the smell attracts the early flying bees, and the fermentation warms the flower by as much as 4°C above the ambient temperature.

Black Bryony *Tamus communis*

After the summer blooming, most flowering species close down in the autumn ready for a winter break. There are fewer and fewer flying insects and so there is little point in plants expending resources to produce new flowers that will fail to pollinate, it is now all about setting next year's seeds.

Sidmouth is said to enjoy a 'Goldilocks' climate, not too cold in winter and not too hot in summer. That is one of the reasons it became a fashionable resort in Regency times, particularly for people seeking convalescence. It is also why we have so many plants, wild and cultivated, flowering out of season.

In 1872, Dr. J. Ingleby Mackenzie, physician to the Sidmouth Dispensary and an accomplished meteorologist, presented a paper to the Devonshire Association for the Advancement of Science, Literature and Art on his weather records from 1865-71. He produced many tables of data, one to demonstrate that Sidmouth had a more equable climate than Greenwich, warmer in the winter but cooler in the summer.



396 SEVEN YEARS' METEOROLOGY OF SIDMOUTH.

COMPARISON OF THE MEAN TEMPERATURE OF GREENWICH AND SIDMOUTH DURING THE YEARS 1865–1871.

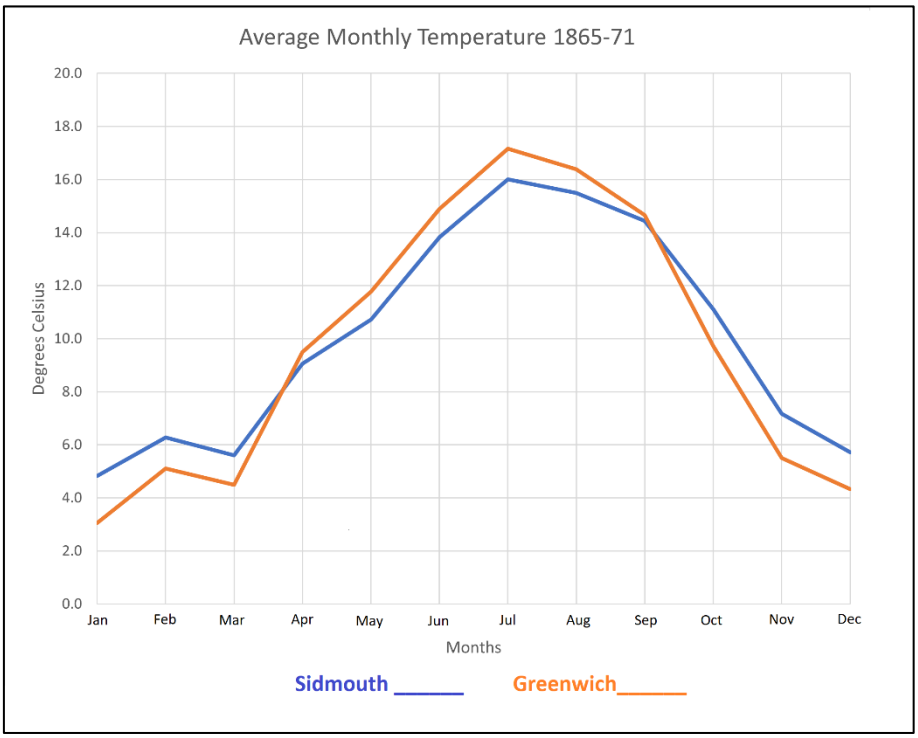
	1865 G.	1865 S.	1866 G.	1866 S.	1867 G.	1867 S.	1868 G.	1868 S.	1869 G.	1869 S.	1870 G.	1870 S.	1871 G.	1871 S.	G. S. Average.	
January	36·3	37·8	42·6	44·4	34·2	37·3	37·2	40·4	41·1	45·8	38·3	42·6	33·2	36·6	37·5	40·7
February	36·6	39·7	40·5	42·2	44·7	46·2	43·0	44·2	45·3	47·1	36·2	39·9	42·4	44·0	41·2	43·3
March	36·6	38·9	40·3	41·6	37·7	38·8	44·0	46·1	37·5	40·6	39·6	44·0	44·9	44·6	40·1	42·1
April	52·3	51·5	47·9	47·8	49·0	49·2	48·1	47·7	50·3	48·7	48·9	46·2	47·7	49·1	49·1	48·3
May	56·1	53·3	50·1	49·2	53·4	51·6	57·3	53·7	50·5	50·1	53·4	50·6	51·9	51·0	53·2	51·3
June	60·2	60·7	60·9	57·6	58·1	57·1	62·0	57·0	55·3	54·3	60·9	57·1	54·8	54·4	58·8	56·9
July	63·8	61·8	61·0	60·0	59·4	59·2	67·5	64·0	62·0	60·3	65·4	63·2	61·7	58·5	62·9	60·8
August	59·9	59·1	59·4	58·5	62·0	60·3	63·6	60·4	60·2	59·1	61·1	60·5	64·8	61·6	61·5	59·9
September	63·9	62·0	56·4	57·0	57·6	56·9	60·5	58·9	58·2	57·9	55·7	57·4	57·4	56·0	58·4	58·0
October	50·9	54·1	51·3	53·0	48·7	51·5	47·9	49·8	48·9	50·9	49·8	53·1	49·4	52·6	49·5	52·0
November	44·8	47·3	44·3	48·1	41·1	43·4	41·5	44·2	43·0	46·1	41·5	43·5	37·6	41·7	41·9	44·9
December	42·4	44·7	42·9	46·9	37·5	40·8	46·0	48·6	37·9	39·8	33·6	35·8	38·3	39·9	39·8	42·3
Mean of Year	50·3	50·9	49·8	50·5	48·6	49·3	51·5	51·2	49·2	50·0	48·7	49·3	48·6	49·1	49·4	50·0

The result of this Table is to show that the annual mean temperature of Sidmouth and Greenwich are within about half a degree of each other; but it likewise indicates that though such is the case, Sidmouth is warmer in the winter and cooler in the summer months than Greenwich, proving thereby *its equability of temperature*; for whilst London exceeds Sidmouth in temperature in the six summer months by 0·8—1°·9—2°·4—2°·1—1°·6—and 0°·4—Sidmouth is warmer than London by 2°·8 in January, 2°·1 in February, 2° in March, 2°·5 in October, 3°·0 in November, 2°·5 in December.

Temperature Data Sidmouth and Greenwich 1865-71

It is easier to see the effect if the data is presented as a graph. Over the year, the mean temperature between the two places is quite close but there is a clear pattern of warmer winters and cooler summers in Sidmouth. Recent weather data shows that this is still the case, the main difference is that Sidmouth's mean temperature is now 1.5°C warmer than it was in the 1860s. At the same time,

Greenwich, at the heart of a large city now rather than a riverside village surrounded by farmland as it was 150 years ago, is nearly 4°C warmer than Sidmouth in the summer.



There were 102 species in flower braving the autumn storms of October. They were not recorded in anywhere near the abundance of summer, but species such as the Sea Campion (*Silene uniflora*) on the beach, Green Alkanet (*Pentaglottis sempervirens*) in Salcombe Regis hedges, Wood Avens (*Geum urbanum*) around the edge of Margaret's Meadow, and Buttercups, Meadow and Creeping (*Ranunculus acris and repens*), in the Knapp meadow, were still being found in significant numbers.

The Sid Valley's sheltered climate allows some insects to carry on flying and feeding well past the summer peak. This Drone Fly was photographed on Salcombe Hill on 14th November and this Red Admiral feeding on Ivy (*Hedera helix*) in Salcombe Regis the week before. There were still more than 30 plant species in flower into December when you could see Wild Marjoram (*Origanum vulgare*) and Bush Vetch (*Vicia sepium*) beside the coast path in Salcombe, and Wild Angelica (*Angelica sylvestris*) standing among the graves in Salcombe Regis churchyard.

Table 1 shows a selection of species and the months in which they were recorded in flower. Green months are the expected flowering months according to the Collins Wild Flower Guide 2016 Edition, orange months are extra months when the plants were recorded as still flowering.

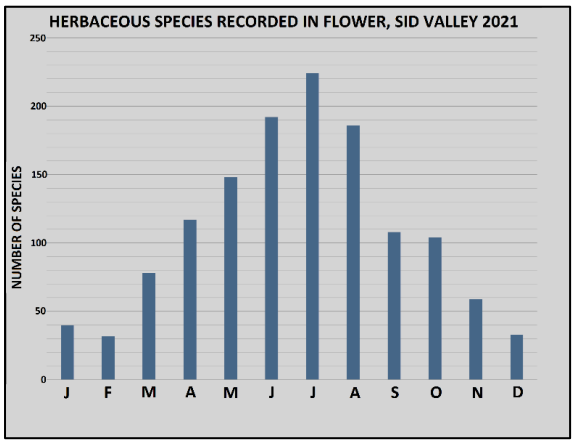
Common Name	*Latin Name*	*J*	*F*	*M*	*A*	*M*	*J*	*J*	*A*	*S*	*O*	*N*	*D*
Alkanet, Green	*Pentaglottis sempervirens*	0	0	1	1	1	1	1	1	0	1	1	1
Avens, Wood	*Geum urbanum*	0	0	1	1	1	1	1	1	1	1	0	0
Buttercup, Creeping	*Ranunculus repens*	0	0	0	1	1	1	1	1	1	1	1	0
Buttercup, Meadow	*Ranunculus acris*	0	0	0	1	1	1	1	1	1	1	1	0
Campion, Sea	*Silene uniflora*	0	0	0	1	1	1	1	1	1	1	1	0
Clover, Red	*Trifolium pratense*	0	0	1	1	1	1	1	1	1	1	1	1
Daisy, Ox Eye	*Leucanthemum vulgare*	1	0	0	0	1	1	1	1	1	1	0	1
Hogweed	*Heracleum sphondylium*	1	0	0	0	1	1	1	1	1	1	1	1
Marigold, Pot	*Calendula officinalis*	1	1	1	1	1	1	1	1	1	0	0	0
Nipplewort	*Lapsana communis*	1	0	1	1	1	1	1	1	1	1	1	1
Yarrow	*Achillea millefolium*	1	0	0	0	1	1	1	1	1	1	1	1

Table 1, monthly records for a selection of species flowering in the Sid Valley 2021.

There is one species in the survey that is expected to be in flower all year according to Collins, the Common Daisy, and it was recorded every month, but so were ten other species, see Table 2. Some, such as Trailing Bellflower and Mexican Fleabane, are garden escapes selectively bred from the wild originals for a longer flowering season, but not the whole year. The RHS website lists Trailing Bellflower as flowering in summer and early autumn and Mexican Fleabane as summer flowering.

Common Name	*Latin Name*	*J*	*F*	*M*	*A*	*M*	*J*	*J*	*A*	*S*	*O*	*N*	*D*
Bellflower, Trailing	*Campanula poscharskyana*	1	1	1	1	1	1	1	1	1	1	1	1
Campion, Red	*Silene dioica*	1	1	1	1	1	1	1	1	1	1	1	1
Daisy, Common	*Bellis perennis*	1	1	1	1	1	1	1	1	1	1	1	1
Dandelion	*Taraxacum sp.*	1	1	1	1	1	1	1	1	1	1	1	1
Fleabane, Mexican	*Erigeron karvinskianus*	1	1	1	1	1	1	1	1	1	1	1	1
Groundsel, Common	*Senecio vulgaris*	1	1	1	1	1	1	1	1	1	1	1	1
Herb Robert	*Geranium robertianum*	1	1	1	1	1	1	1	1	1	1	1	1
Sow Thistle, Smooth	*Sonchus oleraceus*	1	1	1	1	1	1	1	1	1	1	1	1
Spurge, Petty	*Euphorbia peplus*	1	1	1	1	1	1	1	1	1	1	1	1
Toadflax, Ivy-Leaved	*Cymbalaria muralis*	1	1	1	1	1	1	1	1	1	1	1	1
Vetch, Bush	*Vicia sepum*	1	1	1	1	1	1	1	1	1	1	1	1

Table 2, Species recorded in flower in the Sid Valley every month of 2021.



The valley may have extended flowering seasons, but it is still true that there are more flowers around in the summer months and there is a decline in the autumn. The group did not estimate frequency, but the monthly species count gives a clear picture. The dip in February is because species such as Oxeye Daisy, Hogweed and Bristly Oxtongue, continued flowering from the previous late autumn but were finished off by February's cold weather and didn't reappear for several months.

HABITATS

Tormentil *Potentilla erecta* on Muttersmoor

Apart from Sidmouth town itself, the whole of the Sid Valley is in the East Devon Area of Outstanding Natural Beauty. One of the reasons the Sid Valley has such a diverse flora is that it includes several distinct habitats that are home to their own populations of species. We have valley floor pastures on rich alluvial soils, and lowland heath on wet and inhospitable clay with flints. We have halophytes, salt tolerant species, living on the beach and on the windswept coast path cliffs. We have steep woodland on the Upper Greensand deposits, and a range of banked hedges with different woody species in different parts of the valley, some mainly Elm, others are mainly Blackthorn or Beech, and some are multi-species, probably because they have been in place for several centuries.

The Town

Shaggy Soldier *Galinsoga quadriradiata*

Many of the observations were made in an ad hoc manner as the volunteers went for lockdown relieving walks. To widen the data capture as much as possible, seventeen sites around the valley were selected for regular visits. One habitat that was not on the list, but which threw up many interesting observations, was the town centre. A surprising number of species are living in cracks and crevices at the foot of walls. The agricultural weed Shaggy Soldier (*Galinsoga quadriradiata*) was found growing behind Winchester's green grocer shop right in the middle of town. It is a wild flower in Peru but a weed to farmers here and the seeds were probably dropped while unloading the vegetables.

Wild flowers growing in the town is a contentious issue. Many people are happy to see them because they know they are supporting wider biodiversity; others see them as untidy and a sign that the town is not being looked after. This is particularly so with recent decisions by the Town and East Devon Councils to join the Life on the Verge project. They have reduced the cutting regime for some grass verges to promote a diversity of wild flowers and provide wildlife corridors, stepping stones to allow the interconnectivity of other species, particularly flying insects.

The population of flying insects has crashed in the last fifty years for a number of reasons. Some people see this as an environmental disaster, others do not. One correspondent in the Sidmouth Herald wrote that she didn't want to live in a world full of bugs. Those who know the vital importance of pollinating insects to our survival need to work very hard to improve public awareness of the importance of biodiversity.

Many of the town centre flowers have arrived through human activity. As reported above, the daisy-like flowers of Mexican Fleabane (*Erigeron karvinskianus*) are a common sight around town all year long. Many walls sprout bunches of the small purple and yellow flowers of Ivy Leaved Toadflax (*Cymbalaria muralis*). These two species are introduced and probably garden escapes.

Ivy-leaved Toadflax *Cymbalaria muralis*

Danish Scurvygrass *Cochlearia danica*

In spring, the bases of many walls near the Esplanade have lines of dense green foliage and sprays of tiny white flowers. These can be native Hairy Bittercress (*Cardamine hirsuta*) and Shepherd's Purse (*Capsella bursa-pastoris*), but they are joined by Danish Scurvygrass (*Cochlearia danica*) with its kidney-shaped leaves tinged with purple. The scurvygrasses are seaside plants and have been used by sailors to counter the awful disease that plagued them on long voyages. They are related to cresses and have a spicy taste that makes them very palatable.

There is an English Scurvygrass which was recorded by Cullen, but it has not been found this year. Danish Scurvygrass arrived at some time in the past, probably as seeds carried on the boots of sailors coming ashore. As a halophyte, it was restricted to seaside locations originally, but now it is spreading along the trunk roads radiating away from major ports. It is believed that winter salt on the roads allows the seeds carried on lorry tyres to find roadside conditions similar to the salty beach. In continental Europe, Danish Scurvygrass has been carried as far inland as Hungary.

Pellitory-of-the-Wall *Parietaria judaica*

One particular wall could almost be considered a self-contained nature reserve, the wall on the eastern side of the churchyard, alongside Church Lane. This old wall has the benefit of lime mortar in the joints rather than modern Portland cement mortar. Many plants can colonise lime mortar but not the more caustic modern product. Apart from plants on the ground near the wall, there are twelve species of plant growing on the wall itself including two so used to this habitat it is in their name, there is Pellitory-of-the-Wall (*Parietaria judaica*) and the small, non-flowering fern Wall Rue (*Asplenium ruta-muraria*). *Parietaria* derives from the Latin for a domestic wall and *muraria* from the Latin for a city or town wall.

Medieval herbalists thought that, as Pellitory of the Wall was able to get its roots into the mortar, it might be good for treating bladder stones and other urinary problems. Some modern herbal companies still market it as such, but there is no good evidence that it is effective.

Much of modern Sidmouth town was still farmland in Cullen's time as recorded on the Tithe Map drawn up in 1839. You can still find remnants of the field boundaries at many points around the town, and some retain populations of their wild flowers. Behind the cricket pavilion and tennis courts is a path alongside one such bank. It used to be the boundary hedge for Back Fort Field, a pasture leased from the Manor by James Hook, now it is the boundary for the Fortfield and Kenandy apartments. If you walk along the path at different times of year you can see wild flowers that Cullen would have seen such as Primroses (*Primula vulgaris*), Barren Strawberry (*Potentilla sterilis*), Bird's-foot Trefoil (*Lotus corniculatus*) and Wild Madder (*Rubia peregrina*). Unfortunately, this bank is becoming swamped by another modern garden escape, the Three Cornered Garlic or Leek (*Allium triquetrum*) which is native to the Mediterranean. This is a very decorative plant, but it is as invasive as the Himalayan Balsam (*Impatiens glandulifera*) that is choking the banks of the River Sid in some places, and both smother the native plants.

3 Cornered Leek *Allium triquetrum*

Keeled Cornsalad *Valerianella carinata* £1 coin gives scale

The Harbour Hotel stands in what used to be a pasture called Little Meadow leased from the Manor by Mary Baynes in 1839. The bank that fronts the site alongside Peak Hill Road is marked as a hedgerow on the old Tithe Map and it still has many wild flowers that the hotel gardener didn't plant. These include bunches of the tiny blue stars of Keel-fruited Cornsalad (*Valerianella carinata*), Early Dog Violets (*Viola reichenbachiana*) and the fuzzy brown spikes of Field Woodrush (*Luzula campestris*).

Common Dog Violet *Viola riviniana*

Cheese Lane has old hedgerow banks alive with many species of wild flower, as do sections of Beatlands and Cliff Road, Alma Lane, Lymebourne Lane and Core Hill Road. There is an old agricultural path that linked Woolbrook and Manstone that still exists amid the later urbanisation. Several sections still have their hedgerows although they are now overgrown, as are the field hedges that run alongside the footpaths in the Stowford and Lindemann's Close areas. These hedgerows also retain many of the old agricultural 'weeds'. You will find Creeping Cinquefoil (*Potentilla reptans*), Greater Bird's-Foot Trefoil (*Lotus pedunculatus*), Primroses (*Primula vulgaris*), Common Dog Violets (*Viola riviniana*), several Speedwells (*Veronica sp.*) and even Bluebells (*Hyacinthoides non-scripta*).

Greater Bird's-Foot Trefoil *Lotus pedunculatus*

The Beach

Yellow Horned Poppy *Glaucium flavum*

Sea Kale *Crambe maritima*

A shingle beach is a hostile habitat for most herbaceous plants. The shingle is not a stable substrate for the roots, it does not retain rainwater easily and so is nutrient poor. One chemical that is present is salt and in concentrations that are toxic to most herbaceous species. However, there are some species such as Sea Kale (*Crambe maritima*) and Yellow Horned Poppy (*Glaucium flavum*) that have adapted, and these are labelled as halophytes, literally salt plants, by botanists. They have very deep roots to hold on in the unstable ground, and leathery or waxy leaves to cut down on excessive water loss through transpiration. The wax on the leaves often gives them a bluish tinge.

Viper's Bugloss *Echium vulgare*

Many of the halophytes are endangered species and in 2013 Sidmouth in Bloom and the Devon Plant Heritage Group set up Sidmouth's Beach Garden where several halophytes were given what was hoped to be a safe haven. As a demonstration of the hostility of the environment, most of the garden was wrecked by a storm the following year. Volunteers worked hard to restore the feature and Sidmouth's beach is home to several halophytes once again. As with the grass verges, the beach garden is not welcomed universally, some people see it as a weed patch and call for it to be cleared. Perhaps the area would benefit from clear information boards to explain what is being achieved.

Sea Campion *Silene uniflora*

The area by the Millennium Walkway is home to a carpet of Sea Campion (*Silene uniflora*) and the bright blue, bee friendly flowers of Viper's Bugloss (*Echium vulgare*).

The area by the Belmont Hotel is dominated by dark green leathery leaves of Sea Beet (*Beta vulgaris maritima*). A close relative of some of our cultivated beets, such as Sugar Beet, Swiss Chard and Beetroot, it can also be cooked and eaten. The flowers are small rather than showy, but they exude a very fragrant nectar that attracts many insects. The Sea Kale, a relative and possible ancestor of the cultivated Cabbage, was a delicacy in Regency England when it was grown in the dark to blanch the stems and it is still foraged today.

The bank around the walkway down to Jacob's Ladder Beach has a very rich diversity of wild flowers including the seaside specialist Sea Thrift (*Armeria maritima*), and the flat or concave white umbels of Wild Carrot (*Daucus carota*), but there is also its maritime sub-species Sea Carrot (*Daucus carota Gummifer*) with its domed umbels. An umbel is a cluster of small flowers that come together to present a much larger enticement for pollinators. If you stand and watch for a few minutes, you will see that both shapes of flower umbel are great favourites with flying and crawling insects.

Wild Carrot *Daucus carota*

Sea Carrot *Daucus carota Gummifer*

The cliff face by Jacob's Ladder itself has been taken over by another non-native escape, *Carpobrotus edulis* (this translates as edible fruit) from South Africa. Once known as *Mesembryanthemum edulis* and the Hottentot Fig, its common name has also changed and is now Sour Fig or Claw Fruit. The Sidmouth variety has large yellowy-white flowers, but there is a pink flowered colony at Budleigh Salterton.

Just as unstable as the shingle is the area at the foot of the western cliffs. It might not be a good idea to walk along looking for wild flowers, but several species manage to make it home including Colt's Foot (*Tussilago farfara*), Bristly Oxtongue (*Helminthotheca echioides*) and Creeping Cinquefoil (*Potentilla reptans*), all brought down from the field above in cliff falls probably.

Lowland Heath

Another challenging habitat is the heath covering the hilltop plateau that surrounds the valley, although above our valley, it is relatively low compared to much UK heathland. In the time of Dr Cullen, the whole valley was ringed with land too poor to cultivate because of the acidic wet soil that is an unworkable mixture of clay and flint. Salcombe Hill was enclosed in the second half of the 19th century as an attempt at farming, but it was not successful. Much of the heathland is now coniferous plantation and supports very little in the way of herbaceous flora. Areas of Mutter's Moor have been left as open heath and are now being managed by Clinton Devon Estates as a nature reserve. Without this management, large areas of the moor would be overtaken by the Bracken (*Pteridium aquilinum*) and Gorse (*Ulex europaeus*), and eventually become scrubby woodland.

Cross-leaved Heath *Erica tetralix*

Bilberry *Vaccinium myrtillus*

The beach has its salt plants or halophytes, heathland has its acid plants. Sometimes referred to as ericaceous plants. The Ericaceae family are among the commonest plants on acidic heath and moorland soils, Erica has a Latin root meaning heathland. There are several members of the family on Mutter's Moor, including Bell

Heather (*Erica cinerea*), Cross-leaved Heath (*Erica tetralix*), Spring Heath (*Erica carnea*), and Bilberry (*Vaccinium myrtillus*).

Woodland

When Dr Cullen was conducting his survey, there was little woodland in the valley and most of his woodland species were found over the hill in Harpford Wood, an ancient woodland that is now managed actively by Clinton Devon Estates to maintain its biodiversity. With the enclosure of the heathland, we now have approximately four times as much woodland, but we do not have four times the woodland flowers because most of the increased tree cover is coniferous plantation which is an alien habitat to our native species.

Of the broadleaf woodland, the riverside area alongside Margaret's Meadow and Gilchrist Field in The Byes is among the most interesting. Through the spring and summer, you will find Snowdrops (*Galanthus nivalis*), Winter Aconite (*Eranthis hyemalis*), Stinking Iris (*Iris foetidissima*), Ramsons or Wild Garlic (*Allium ursinum*), Pink Purslane (*Claytonia sibirica*), Wood Dock (*Rumex sanguineus*) and Wood Speedwell (*Veronica montana*). There are some Bluebells (*Hyacinthoides non-scripta*) and Foxgloves (*Digitalis purpurea*), but the best displays of these are in the woodlands on the steep Upper Greensand slopes on either side of the valley, particularly above Milltown and Grigg's Lane on Salcombe Hill, and above Bickwell Lane on Bulverton Hill.

Snowdrop *Galanthus nivalis*

Winter Aconite *Eranthis hyemalis*

At the northern end of the valley around the various springs that feed the very young river, there are areas of very wet woodland interspersed with boggy open glades. These were surveyed with the landowners' permission. Here you can find Marsh Stitchwort (*Stellaria palustris*) and its tiny flowered relative Bog Stitchwort (*Stellaria alsine*). There is Water Pepper (*Persicaria hydropiper*) with its tongue numbing flavour, and the much sweeter Water Mint (*Mentha aquatica*). The biennial Marsh Thistle (*Cirsium palustre*) has its spectacular first year leaf rosettes that flatten surrounding vegetation and then erupt into the slender 2m tall flower spikes.

Bog Stitchwort *Stellaria alsine* plus fingertip

Unlike much of the valley's woodland, it is possible that these woods are ancient, that means they have been woodland since before Tudor times. Apart from documentary evidence of old maps, there are a number of woodland plant species present that suggest ancient woodland. There is Wood Sorrel (*Oxalis acetosella*), Wood Spurge (*Euphorbia amygdaloides*), Dog's Mercury (*Mercurialis perennis*), Wood Anemone (*Anemone nemorosa*), Opposite-leaved Golden-saxifrage (*Chrysosplenium oppositofolium*) and Yellow Pimpernel (*Lysimachia*

nemorum). Also, there are non-flowering indicator species such as the Hard Fern (*Blechnum spicant*) and Scaly Male-fern (*Dryopteris affinis*) which have been recorded ready for the 2022 survey.

Broad-leaved Helleborine
Epipactis helleborine

Enchanter's-nightshade *Circaea lutetiana*

The Knapp Nature Reserve was mainly pasture until it was purchased as a public open space by EDDC. The woodland was planted less than thirty years ago. and has a much less diverse herbaceous flora than the woodland at the head of the valley. Two interesting residents are the Broad-leaved Helleborine (*Epipactis helleborine*) from the Orchid family, and Enchanter's Nightshade (*Circaea lutetiana*) named after Circe, the sorceress who turned Odysseus' crew to swine in Homer's Odyssey.

Farmland

The majority of the land in the Sid Valley is farmland in various states of cultivation and neglect. At the time Dr Cullen was working, the valley was mainly a mixture of arable fields, meadows, and pastures, with large areas of heath as common land, see Table 3.

Parish	Arable	Pasture & Meadow	Common	Woodland	Orchard	Acres
Sidbury	1,677	2,279	1,440	428	221	6,045
Sidmouth	721	345	128	2	112	1,308
Salcombe Regis	530	550	200	150	56	1,486
	2,928	3,174	1,768	578	389	8,837
Parish	Arable	Pasture & Meadow	Common	Woodland	Orchard	
Sidbury	27.7%	37.7%	23.8%	7.1%	3.7%	100%
Sidmouth	55.1%	26.4%	9.8%	0.2%	8.6%	100%
Salcombe Regis	35.7%	37.0%	13.5%	10.1%	3.8%	100%
	33.1%	35.9%	20.0%	6.5%	4.4%	100%

Table 3. 1839 Tithe Apportionments

Farming has undergone great changes in recent years, and this has had a major impact on biodiversity throughout the farmed world as well as our valley, but this is not a new phenomenon.

Nearly all the fields on the eastern hillside above Sid Road are listed as arable on the Tithe Map, but this was to change soon afterwards. The diaries of J.G. Cornish in the 1870s lament how changes from arable to pasture on the hillside have reduced the number of partridges (a precursor to the 1960s Silent Spring where changes in agriculture triggered the depletion of farmland birds).

"*Partridges were plentiful then, for nearly all the red marl on the west side of Salcombe Hill was under the plough and much of the poor light land on the hilltop, while further east and north where the hilltop clay is deeper there were few grass fields. So the partridges reared fine broods on the hillsides and the light land …*

And the country was far more interesting, for there was the change of crops, wheat, barley, oats, rye-grass, fallow, mangolds, turnips, where now we find only one or two arable fields to six or eight of grass." (Parishscape, 2006, The Parishscapes Project Community Report, East Devon AONB, https://www.eastdevonaonb.org.uk/wp-content/uploads/2020/02/Branscombe-and-Beer-report-DRAFT.pdf)

J.G. Cornish held the principal interest in the common and therefore was one of the main drivers of the enclosure of Salcombe Hill in the 19th century which played a part in the changes he is lamenting; the law of unintended consequences is not a new thing.

It is likely that the arable farming of these fields was a temporary phase brought about by the Napoleonic Wars when much pasture had been ploughed up to increase wheat production. Wheat prices collapsed after the war ended and there was a steady return to pasture in many parts of the country including the Sid Valley. Some farmland has been lost to building development, but the majority of the remaining eastern hillside is still under grass and partridges are a rare sight. However, the outlook for grassland wild flowers and their dependent insects has changed again in the last fifty years.

Salcombe Hill 2021

Grassland

Agricultural grassland falls into two broad categories: pasture and meadow. Pasture is grassland that is grazed by livestock, mainly cattle and sheep, while a meadow is harvested as hay or silage, although it might be grazed after the cut. The field names in the valley floor recorded on the Tithe map suggest that they have been pasture and meadow for centuries. Archaeological evidence from the Axe and Clyst valleys suggests valley floor farming may date as far back as the Bronze Age 5,000 years ago. Over the centuries, traditional farming methods allowed very diverse populations of non-grasses to grow in these fields, particularly the meadows where the non-grasses had time to flower and set seed before the late summer cut, and the seeds could fall to the ground while the hay was drying in the field. The floral diversity supported a similar scale of faunal diversity, from soil and flying invertebrates to populations of reptiles, birds and small mammals.

The Haymaker, Julien Dupré

Wild flower meadows are receiving a lot of attention at present because there are so many stories of their decline and the impact this is having across our natural species. There are widespread reports that we have lost up to 97% of our wild flower meadows since the 1930s. Even with the loss to building development, more of our valley is under grass now than at the time of Dr Cullen but we have far fewer grassland flowers now, again because of changes in farming practices.

Silage bales, picture Nigel Ollis/ Guardian

As mentioned above, hay meadows had a rich floral diversity because the non-grass species had time to set and drop seeds. Most modern meadows are not used for hay but silage. Instead of the cut being left to dry, silage relies on the water content being retained. The cut, along with any non-grass seed heads that are there, is cleared from the field immediately and stored in a way that encourages the rotting or fermentation. Sometimes it is rolled up and wrapped in plastic, other farmers collect it up and store it in a silo.

A switch from hay to silage is not the only problem. Many of the non-grass species of the meadows and pastures are adapted to thrive in poor soil. This means they are not particularly nutritious as part of the animal fodder. The last hundred years has seen an increase in the use of artificial fertilisers to improve grassland production. If you apply these fertilisers to a field, the grasses, particularly modern varieties such as Perennial Rye Grass (*Lolium perenne*), thrive to out-compete and swamp the non-grasses. The drive to do this is because both the hay or silage, and the grazing on pastures, will support more animals per hectare.

There are some areas of grassland in the valley that are being managed to promote non-grass wild flowers, but they are only a small fraction of the land. That is why roadside verges and garden plots are so important.

Alma Field

On Salcombe Hill, the National Trust has a field that is left as meadow and the Town Council has Alma Field which was sown with a commercial wild flower seed mix and is managed with a cut and clear regime that has allowed a profusion of flowers in the summer including Ox-Eye Daisies (*Leucanthemum vulgare*), Hairy Tare (*Vicia hirsuita*) and Common Toadflax (*Linaria vulgaris*). The Town Council has similar plans for the parkland area of Knowle. EDDC has the Delderfield Nature Reserve, and the Sid Vale Association owns three distinct areas managed to promote wild flower diversity: The Knapp Nature Reserve, the James Cornish Field on Salcombe Hill, Margaret's Meadow and Gilchrist Field in The Byes.

Common Toadflax *Linaria vulgaris*

The eastern meadow in The Knapp is already a success with a significant increase in floral diversity over the last three years. There are Cowslips (*Primula veris*), three different Buttercups (*Ranunculus acris, bulbosus and repens*), Lesser Celandine (*Ficaria verna*) and Cuckoo Flower (*Cardamine pratensis*) in early spring, followed by many Southern Marsh Orchids (*Dactylorhiza*

Cowslips *Primula veris*

praetermissa), various Vetches and Trefoils, Yellow Rattle (*Rhinanthus minor*) an important factor in reducing the rank grasses which overpower the broadleaved 'weeds', Yarrow (*Achillea millefolium*), and Cat's Ear (*Hypochaeris radicata*). The western meadow and Peasland Knapp are catching up albeit with different species because of their particular characteristics.

One non-floral success of the Knapp is the grasshopper and cricket population. Nationally, these are in decline because they are fussy about where they will thrive. They need a grass that is in patches of mixed length and is cut in such a way that they can escape the mower. Mainly by chance, the Knapp complex suits them well. Now that this is known, the management regime will have their needs included to maintain the population.

Dark Bush Cricket *Pholidoptera griseoaptera*

The James Cornish Field on Soldier's Hill continues to develop but the cut and clear regime is producing a different plant population to the Knapp, mainly because the underlying geology is so different, and it is more than 100m higher above sea level. There is a significant population of Red and White Clover (*Trifolium pratense and T. repens*), Lesser Trefoil (*Trifolium dubium*) and Lesser Stitchwort (*Stellaria graminea*), but few grasshoppers. Common Spotted Orchids (*Dactylorhiza fuchsii*) have been recorded in the south-eastern meadow, but none were seen this year.

Lesser Stitchwort *Stellaria graminea*

The north-eastern and north-western boundaries of the James Cornish Field have a significant strip of semi-scrub left uncut for longer than the main meadow. This dense mix of Bracken (*Pteridium aquilinum*), Gorse (*Ulex europaeus*) and Blackthorn (*Prunus spinosa*) provides a home for species that would struggle to cope with the meadow mowing, including Foxgloves (*Digitalis purpurea*), Hogweed (*Heracleum sphondylium*), Angelica (*Angelica sylvestris*), and Red Campion (*Silene dioica*).

Wild Angelica *Angelica sylvestris*

In the past, Margaret's Meadow and Gilchrist Field in The Byes did not have the diversity of flowering species that might be hoped for in fields that have been undisturbed if not unimproved for longer than The James Cornish Field and, to a lesser extent, The Knapp complex. They should be the most amazing species-rich grassland with a profusion of flowering plants supporting a myriad of invertebrates and a wide range of UK vertebrates. The woodland area alongside the river has excellent biodiversity, but the grassland areas were dominated by rank grasses and rushes with far fewer flowering species both in variety and population density than The Knapp.

Yellow Rattle *Rhinanthus minor*

Field Bindweed *Convolvulus arvensis*

Things have moved on in the last two years and survey visits have found areas where Yellow Rattle (*Rhinanthus minor*) has been sown to reduce the rank grasses, and species such as Bird's-foot Trefoil (*Lotus corniculatus*), Common Mouse-ear (*Cerastium fontanum*), Knapweed (*Centaurea nigra*) including a pure white variety, Field Bindweed (*Convolvulus arvensis*), and Lesser Celandine (*Ficaria verna*) are thriving. Colonies of Germander Speedwell (*Veronica chamaedrys*), Lesser Stitchwort (*Stellaria graminea*), and Lesser Trefoil (*Trifolium dubium*) can be seen among the tall grass flower spikes. Margaret's Meadow has a good population of Pignut (*Conopodium majus*), and Hogweed (*Heracleum sphondylium*) is moving from the edge into the meadow.

Wetland

Dr Cullen lists many herbaceous species associated with bogs, ponds and streamsides. The Victorian farmland would have plenty of places for wetland species. There are at least 20 riverside fields named Ham on the 1839 Tithe Maps, a name now believed to be for a pasture prone to flooding. There are several Pond Meadows and Pond Orchards listed in the Tithe Apportionments. The woodland and fields at the head of the valley are still wet and have characteristic wetland species, but most of the wet fields and the ponds lower down the valley have been drained.

River Water-Crowfoot *Ranunculus fluitans*

The survey found some wetland plants, for example Southern Marsh Orchid (*Dactylorhiza praetermissa*), Marsh Cudweed (*Gnaphalium uliginosum*) and Bogbean (*Menyanthes trifoliata*), but we might have lost many plants such as Marsh Ragwort (*Senecio aquaticus*), listed as declining by the Collins Guide, and the scarce Marsh Arrow Grass (*Triglochin palustre*) that Cullen recorded. The Ranunculaceae family has many water plants, but the 2021 survey only located two, River Water-Crowfoot (*Ranunculus fluitans*) and Common Water-Crowfoot (*Ranunculus aquatilis*). There is a hope that many other water plants are living happily in garden ponds.

Arable Fields

Scarlet Pimpernel *Lysimachia arvensis*

Access to arable fields was difficult for the volunteers and observations were restricted to field edges alongside public footpaths. Wild flowers of disturbed ground, agricultural weeds to the farmers, have also declined in the last fifty years because of developments in farming practice, particularly the use of herbicides that target selected plant groups. However, the field edges still hold populations of Scarlet Pimpernel (*Lysimachia arvensis*), Charlock (*Sinapis arvensis*), Scentless Mayweed (*Tripleurospermum inodorum*), Pineapple Weed (*Matricaria discoides*), Red Deadnettle (*Lamium purpureum*), and Redshank (*Persicaria maculosa*) among many. Two examples of species with old common names are Ploughman's Spikenard (*Inula conyzae*) which grows in stony ground and Swine-cress (*Lepidium didymus*) which is

often found around pig farms. Most of the fields were bordered by hedges and, in many cases, it is impossible to define whether a species is one of the open fields or of the hedges.

Hedges

Banked hedges can be rich in herbaceous diversity.

Devon hedges are special for two reasons, most of them comprise woody shrubs on an earth bank, and most of them have been in place for many centuries and this has allowed a proliferation of species.

In Devon, the term hedge refers to the bank as well as any shrubs. The in-town hedges were discussed earlier. The 2020 Sidmouth Arboretum Hedge Survey estimated there are still about 500km (310 miles) of agricultural hedge in the valley. Changes in field patterns and farming methods mean that it was probably closer to 750km (460 miles) in Dr Cullen's time.

One of the findings of the 2020 survey was that many of the hedges were home to a rich diversity of herbaceous plants with over 140 species being recorded in all. This network plays a vital role in the valley's biodiversity, not just because of the species count but because the hedges act as wildlife corridors allowing dispersal between isolated habitats. In Dr Cullen's time they would have been even richer because the hedges would have been maintained by manual labour rather than tractor mounted flails.

Old Man's Beard *Clematis vitalba* in flower

One group of herbaceous plants that rely on the hedges are climbing plants such as Black Bryony (*Tamus communis*), Bittersweet (*Solanum dulcamara*), Old Man's Beard (*Clematis vitalba*), Hedge Bindweed (*Calystegia sepium*) and Large Bindweed (Calystegia sylvatica). They twist and twine themselves upwards around the woody plants to reach the light.

There is not much broadleaf woodland in the valley but, in many ways, the hedges present a similar habitat to woodland edges, and they are home to many plants of the woodland edge. The yellow stars of Wood Avens (*Geum urbanum*) are common, as are the white stars of Greater Stitchwort (*Stellaria holostea*) and the tiny flowered Wood Sage (*Teucrium scorodonia*). As well as remaining in flower throughout the year, Red Campion (*Silene dioica*) is almost ubiquitous in the valley's hedges, as is the Stinging Nettle (*Urtica dioica*). Both having the Latin name *dioica* does not mean they are related; it means both have separate male and female plants.

Broad-leaved Willowherb *Epilobium montanum*

Marsh Willowherb *Epilobium palustre*

There are several Willowherb species (*Epilobium sp.*) in the valley's hedges, and it is a challenge to distinguish them without a magnifying glass and a good wild flower book. The first thing you have to

do is to use a magnifying glass to see if the style inside the flower is four-lobed or club-shaped. This is in flowers that might be as small as 4-6mm across. Then you are into details about hairs on the stem, are there any, and if so are they glandular (with a tiny globule like a pin head) or not.

Broad-leaved Willowherb has four lobes but no hairs, Marsh Willowherb has a club and non-glandular hairs. The survey listed nine species of Willowherb which is not unexpected and all nine are likely to be in the valley but, as the Biodiversity Group is made up of amateurs, one or two of the individual records might be the wrong Willowherb species.

There is one family that thrives by climbing in the valley's hedges, the *Rubiaceae* or Bedstraws. The family name comes from the Roman name for the Madder plant, Rubia. The Madder root was an important source of dyes for the Romans, but that is *Rubia tinctorum*, a different species to our Wild Madder (*Rubia peregrina*) which was found in several hedges. Rather than twining, the Rubiaceae are straggly plants have many hooked hairs on their stems and leaves that allow them to cling onto almost any surface.

Wild Madder *Rubia peregrina*

Cleavers or Goosegrass *Galium aparine*

Cleavers or Goosegrass (*Galium aparine*) is well-known to children who delight in sticking it onto people's backs like Velcro. Other members of the Rubiaceae found in the hedges were Hedge Bedstraw (*Galium album*), Lady's Bedstraw (*Galium verum*), and Woodruff (*Galium odoratum*). Heath Bedstraw (*Galium saxatile*) scrambles among the scrub on Mutter's Moor, and the tiny Common Marsh Bedstraw (*Galium palustre*) thrives in the damp long grass areas of the parkland of Knowle.

Plant Families

While we are talking about families, the 406 species in the survey represented 56 botanical families ranging from the Adoxaceae with Moschatel (*Adoxa moschatellina*) to the Violaceae which includes Sweet Violet (*Viola odorata*) among its members.

The family with the most species recorded was the Asteraceae (literally star flowers), formerly called the Compositae, with 58 species including Dandelions, Hawkweeds, Daisies and Thistles. They are characterised by composite flower heads made of many tiny flowers called florets crammed together on a capitulum. The yellow Dandelion like flowers of various species can be very difficult to distinguish, it takes a lot of practice to know your Hawkbits and Hawksbeards from Hawkweeds.

Autumn Hawkbit *Scorzoneroides autumnalis*

Hawkweed Oxtongue *Picris hieracioides*

Not only does the Asteraceae have its own diversity, but the members are among the most abundant flowers in many sites. The fact that they are so common can lead to them being underrated, but they are very important flowers to local biodiversity.

Some amateur naturalists will, quite rightly, find Orchids exciting, but the common Dandelion does more for local biodiversity. Orchids are very highly evolved, and some will attract and feed only a single species of wasp or bee over a short flowering period. Dandelion flowerheads are open to many different insects and they can be found throughout the year in the sheltered valley. They are a more important food source than the superstar Orchids. We need orchids, but we need Dandelions too.

The survey recorded 23 members of the Apiaceae (literally bee flowers), formerly the Umbelliferae, Parsley like plants with many small individual flowers grouped together in a structure called an umbel to make a more impressive display to attract pollinators. They too can be very difficult to tell apart.

Greater Burnet-Saxifrage *Pimpinella major*

Corky-fruited Water-Dropwort *Oenanthe pimpinelloides*

Also, there were 23 members of the Cabbage family the Brassicaceae, formerly the Cruciferae, with their four-petalled flowers forming a cross. In fourth place came the Pea, Bean, Vetch and Clover family, the Fabaceae, formerly the Leguminosae, with 21 representatives.

The most varied genera were Veronica (Speedwells) with 9 species, Ranunculus (Buttercups and relatives), Epilobium (Willowherbs), Geranium (Cranesbills), and Vicia (Vetches) with 8 species each.

Future Surveys

The Sid Valley Biodiversity Group will be conducting more wildlife surveys of flora and fauna in the years to come, and the volunteers who carried out this survey will be hoping to find more of Dr Cullen's plants, but the 'to find' list is extensive.

The volunteers recorded 407 species in the year. Including the few grasses, rushes, and sedges, 265 are in Dr Cullen's list of 656 species in Flora Sidostiensis. That leaves 391 species to be accounted for. There are 24 species that Dr Cullen recorded in the Otter estuary and Harpford Wood that are unlikely to be found in the Sid Valley. There are 48 woody species that are already known to be in the valley from the 2020 Hedge Survey. There are 22 non-flowering species that will be the subject of a survey by another group. That still leaves 297 species to find.

The 2021 survey was a case of 'let's go and see what we can find'. Future surveys will be more targeted. Now we have a list of target species and, in many cases, where they were found by Dr Cullen. It will be a case of 'we know that Cullen found such and such here, is it still there?'

There are sites which have not been visited this year and they will be where the group hope to start. There are specific areas listed by Dr Cullen that have changed in character, the boggy ponds on Salcombe Hill for example have gone, which will mean the loss of species now rare nationally such as the Lesser Jointed or Bulbous Rush (*Juncus bulbosus*). Some sites, such as the cliffs at Branscombe and Salcombe, will not be visited for safety reasons. This means we may not find Dr Cullen's rare

Rough Podded Purple Vetch (*Vicia bithynica*). However, we are confident that the list of the valley's current Flora Sidostiensis will be extended, and we will post updates on the Biodiversity Group website.

Conclusion

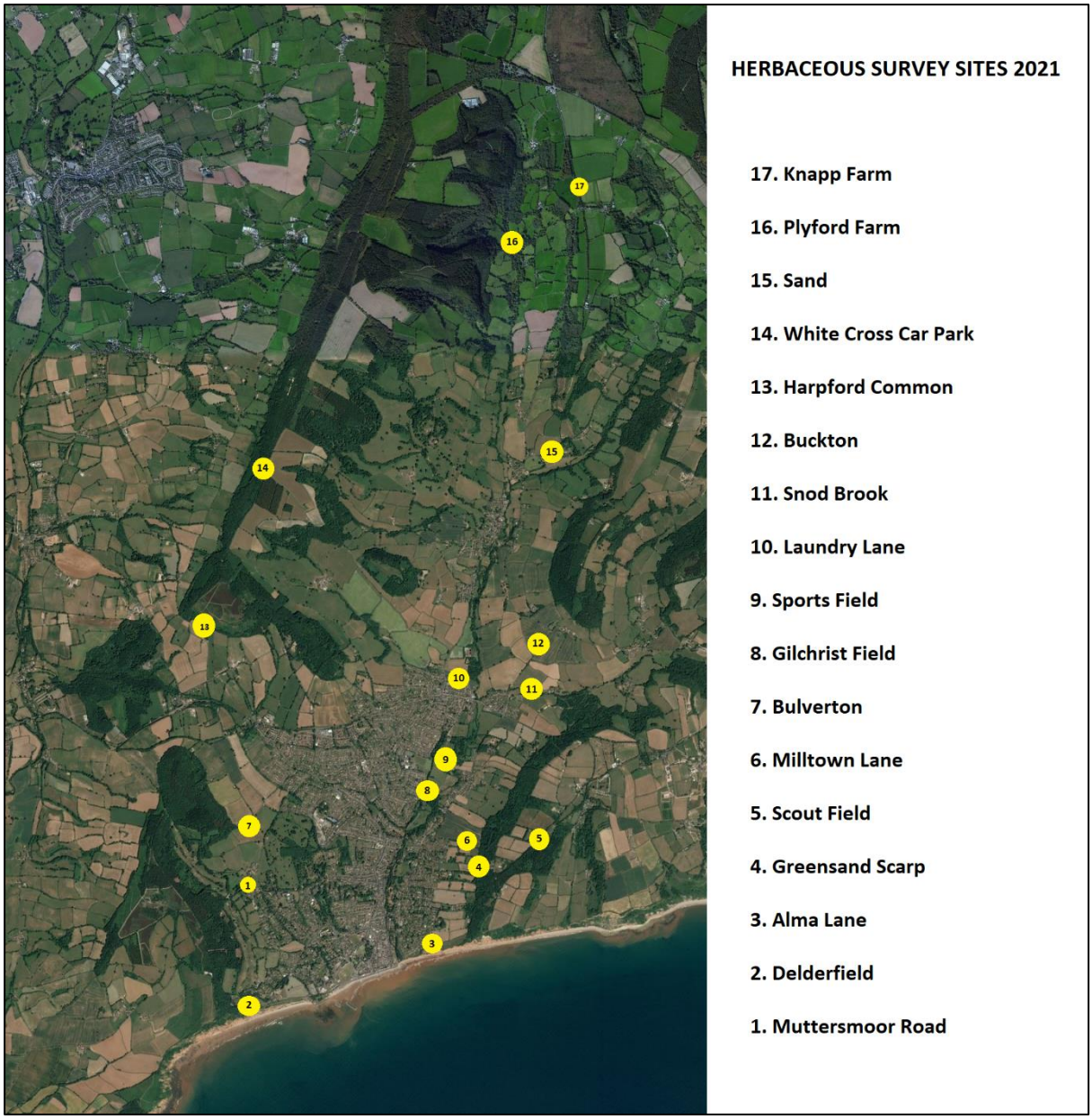
The Sid Valley is still a sheltered home to many of the plant species recorded in W.H. Cullen's Flora Sidostiensis some 170 years ago, that is good news, but there are changes. Some species were not found, possibly they have been missed but they may have disappeared because of environmental changes. The valley is now home to some species not found by Dr Cullen; the country is now home to many species that Dr Cullen could not have found because they were introduced after his survey.

Some authorities talk of the world approaching another mass extinction because of changes to the world's ecosystems. Ecosystems are dynamic, they are always changing. Some question how disastrous the future might be, but the evidence from so many surveys, professional and amateur, is incontrovertible, biodiversity is in decline in so many places. What is difficult to assess is whether the rate of change is historically rapid or severe. We do not have good data on the changes that took place before the 20th century. Hopefully, there will be future surveys to keep track of our wild flowers, and other species.

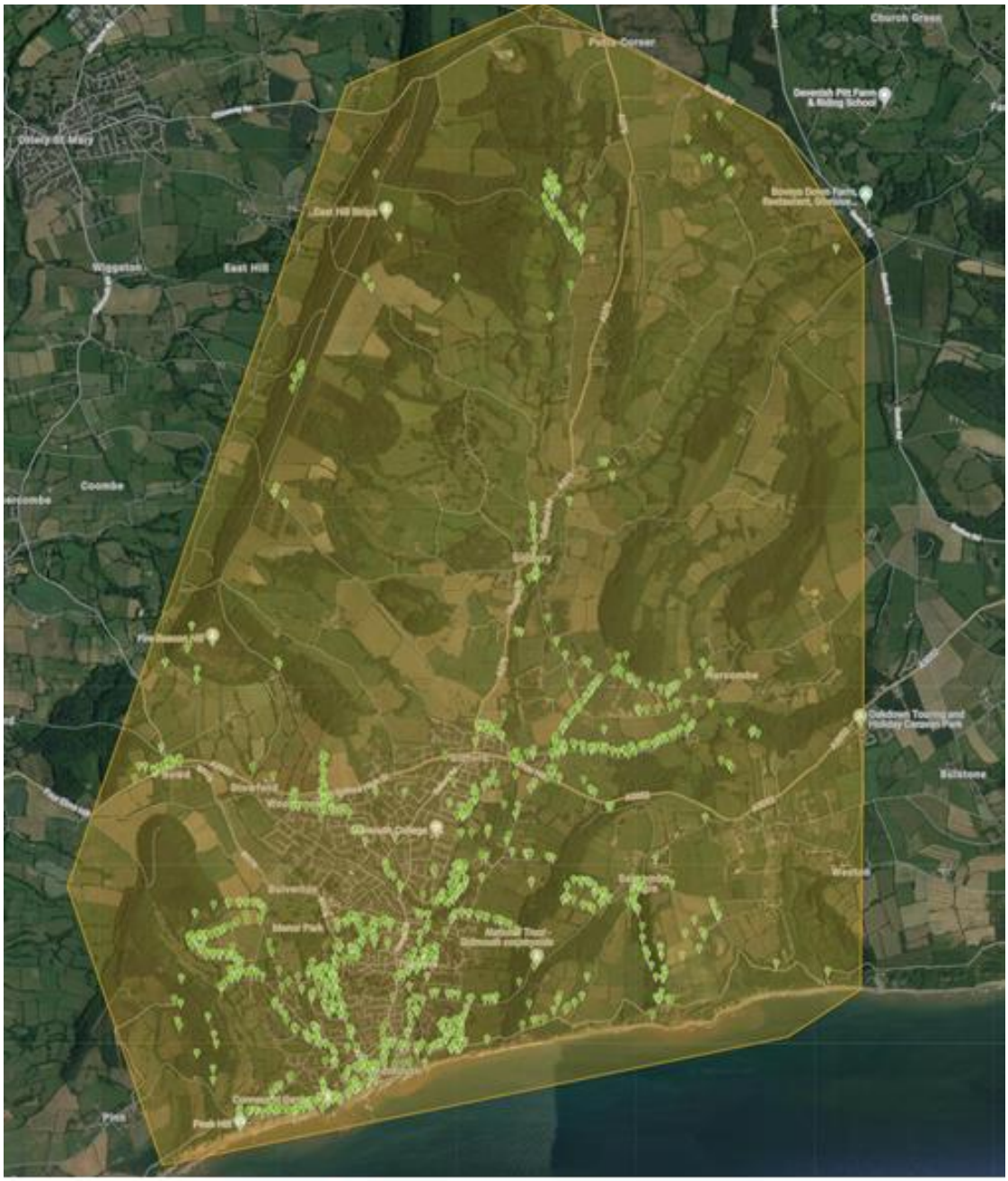
As stated previously, the current survey is missing an assessment of the abundance of many species. There are many small scale studies of populations of individual species, generally endangered and in specific locations. We do have limited data on the falling abundance of birds and butterflies from large scale citizen science programmes such as the Big Garden Birdwatch and the Big Butterfly Count. Our 2021 survey recorded species but did not attempt to quantify the floral abundance. Dr Cullen made comments on frequency for 265 of his 691 species. Ninety two were described as frequent or very frequent, 92 as common or very common, 30 were abundant, 15 plentiful and 11 were said to be everywhere. Fifteen species were found only occasionally and only five were described as rare. It is likely that the balance will have been reversed somewhat since 1849, most dramatically in the last fifty years.

Many people are waking up to what is happening, at international and national levels. Very importantly, local groups in many places are acting. The Sid Valley Biodiversity Group hopes that raised awareness in the local population will lead to many small actions making a large impact on our valley. If every garden had a pond and a wild flower patch, if every field had a metre of uncultivated headland, if every hedge was maintained in a sustainable way, our beautiful valley would continue to have a wealth of wildlife, whatever was happening elsewhere.

Appendix 1 Regular Survey Sites



Appendix 2, iNaturalist Observations



Survey observations on iNaturalist

Appendix 3 Species Lists

The species recorded and the months in which they were recorded in flower in the Sid Valley 2021

1 = recorded, 0 = not recorded. The final column refers to whether or not the species was also recorded in Cullen's 1849 Flora Sidostiensis.

Common name	*Scientific name*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Cullen*
Agrimony	*Agrimonia eupatoria*	0	0	0	0	0	0	1	1	0	1	0	0	yes
Agrimony, Hemp	*Eupatorium cannabinum*	0	0	0	0	0	0	1	1	1	0	0	0	yes
Alexanders	*Smyrnium olusatrum*	1	1	1	1	1	0	0	0	0	0	0	0	no
Alkanet, Green	*Pentaglottis sempervirens*	0	0	1	1	1	1	1	1	0	1	1	1	no
Alyssum, Sweet	*Lobularia maritima*	0	0	0	0	0	0	1	1	1	1	1	1	no
Anemone, Wood	*Anemone nemerosa*	0	0	1	1	0	0	0	0	0	0	0	0	yes
Angelica, Wild	*Angelica sylvestris*	0	0	0	0	0	0	0	1	1	1	1	1	yes
Aster, Sea	*Tripolium pannonicum*	0	0	0	0	0	0	0	1	1	0	0	0	yes
Avens, Wood	*Geum urbanum*	0	0	1	1	1	1	1	1	1	1	0	0	yes
Balm	*Melissa officinalis*	0	0	0	0	0	0	1	1	0	1	0	0	no
Balsam, Himalayan	*Impatiens glandulifera*	0	0	0	0	0	0	0	1	1	1	1	0	no
Bedstraw, Common Marsh	*Galium palustre*	0	0	0	0	0	0	1	0	0	0	0	0	yes
Bedstraw, Heath	*Galium saxatile*	0	0	0	0	0	1	1	0	0	0	0	0	yes
Bedstraw, Hedge	*Galium album*	0	0	0	0	0	1	1	1	0	0	0	0	yes
Bedstraw, Lady's	*Galium verum*	0	0	0	0	0	0	1	1	0	0	0	0	yes
Bellflower, Nettle-leaved	*Campanula trachelium*	0	0	0	0	0	0	1	0	0	0	0	0	no
Bellflower, Trailing	*Campanula poscharskyana*	1	0	1	1	1	1	1	1	1	1	1	1	no
Betony	*Betonica officinalis*	0	0	0	0	0	0	0	1	0	0	0	0	yes
Bilberry	*Vaccinium myrtillus*	0	0	0	0	1	0	0	0	0	0	0	0	yes
Bindweed, Blue Rock	*Convolvulus sabatius*	0	0	0	0	0	0	0	1	0	0	0	0	no
Bindweed, Field	*Convolvulus arvensis*	0	0	0	0	0	1	1	1	1	1	0	0	yes
Bindweed, Hairy	*Calystega pulchra*	0	0	0	0	0	0	0	1	0	0	0	0	no
Bindweed, Hedge	*Calystegia sepium*	0	0	0	0	0	1	1	1	1	1	0	0	yes
Bindweed, Large	*Calystegia sylvatica*	0	0	0	0	0	0	1	1	1	1	1	0	no
Bittercress, Hairy	*Cardamine hirsuta*	0	1	1	1	1	0	0	0	0	0	0	0	yes

Bittercress, Wavy	*Cardamine flexuosa*	0	0	1	1	1	0	0	1	0	0	1	0	no
Bittersweet	*Solanum dulcamara*	0	0	0	0	1	1	1	1	0	0	0	0	yes
Bluebell	*Hyacinthoides non-scripta*	0	0	1	1	1	1	0	0	0	0	0	0	yes
Bluebell, Hybrid	*Hyacinthoides x hispanica*	0	0	1	1	1	1	0	0	0	0	0	0	no
Bogbean	*Menyanthes trifoliata*	0	0	0	0	1	1	0	0	0	0	0	0	yes
Borage	*Borago officinalis*	0	0	0	0	0	0	1	0	0	0	0	1	yes
Bramble	*Rubus fruticosa*	1	0	0	0	1	1	1	1	1	1	1	1	yes
Brooklime	*Veronica beccabunga*	0	0	0	0	1	1	1	0	0	0	0	0	yes
Broomrape, Ivy	*Orobanche hederae*	0	0	0	0	0	0	0	1	0	0	0	0	no
Bryony, Black	*Dioscorea communis*	0	0	0	0	1	1	1	0	0	0	0	0	yes
Buckwheat, Common	*Fagopyrum esculentum*	0	0	0	0	0	0	0	1	0	0	0	0	yes
Bugle	*Ajuga reptans*	0	0	0	1	1	1	0	0	0	0	0	0	yes
Bugloss, Purple Viper's	*Echium plantagineum*	0	0	0	0	0	1	1	1	1	0	0	0	no
Bugloss, Viper's	*Echium vulgare*	0	0	0	0	0	1	1	1	1	0	1	0	yes
Burdock, Lesser	*Arctium minus*	0	0	0	0	0	0	1	1	0	0	0	0	no
Burnet-saxifrage, Greater	*Pimpinella major*	0	0	0	0	0	0	1	0	0	0	0	0	yes
Butchers Broom	*Ruscus aculeatus*	0	1	1	1	0	0	0	0	0	0	0	0	yes
Butterbur	*Petasites japonica*	0	0	1	0	0	0	0	0	0	0	0	0	yes
Buttercup, Bulbous	*Ranunculus bulbosus*	0	0	0	1	0	0	0	0	0	0	0	0	yes
Buttercup, Creeping	*Ranunculus repens*	0	0	0	1	1	1	1	1	1	1	1	0	yes
Buttercup, Meadow	*Ranunculus acris*	0	0	0	1	1	1	1	1	1	1	1	0	yes
Buttercup, Small Flowered	*Ranunculus parviflorus*	0	0	0	0	1	0	0	0	0	0	0	0	yes
Cabbage, Annual Bastard	*Papistrum rugosum*	0	0	0	0	0	0	0	0	1	0	0	0	no
Campion, Bladder	*Silene vulgaris*	0	0	0	0	0	1	1	1	1	0	0	0	yes
Campion, Red	*Silene dioica*	1	1	1	1	1	1	1	1	1	1	1	1	yes
Campion, Sea	*Silene uniflora*	0	0	0	1	1	1	1	1	1	1	1	0	yes
Campion, White	*Silene latifolia*	0	0	0	0	0	0	0	0	0	1	1	0	no
Carrot, Wild	*Daucus carota*	0	0	0	0	0	1	1	1	0	1	1	0	yes
Carrot, Wild Sea	*Daucus carota ssp.gummifer*	0	0	0	0	1	1	1	1	0	1	0	0	yes
Catchfly, Nottingham	*Silene nutans*	0	0	0	0	0	1	0	0	0	0	0	0	yes

Cat's Ear, Common	*Hypochaeris radicata*	0	0	0	0	1	1	1	1	0	1	1	0	yes
Celandine, Greater	*Chelidonium majus*	0	0	0	0	0	0	0	0	0	1	0	0	no
Celandine, Lesser	*Ficaria verna*	1	1	1	1	1	0	0	0	0	0	0	0	yes
Centaury, Common	*Centaurium erythaea*	0	0	0	0	0	0	1	1	0	0	0	0	yes
Centaury, Lesser	*Centaurium pulchellum*	0	0	0	0	0	0	1	0	0	0	0	0	no
Chamomile	*Chamaemelum nobile*	0	0	0	0	0	0	0	0	0	1	0	0	yes
Chamomile, Stinking	*Anthemis cotula*	0	0	0	0	0	0	0	1	0	0	0	0	no
Chamomile, Yellow	*Anthemis tinctoria*	0	0	0	0	0	1	1	0	0	0	0	0	no
Charlock	*Sinapis arvensis*	0	0	1	1	0	0	0	0	1	1	0	0	yes
Chervil, Rough	*Chaerophyllum temulum*	0	0	0	0	0	0	1	0	1	1	0	1	yes
Chickweed	*Stellaria media*	0	0	1	1	1	1	1	1	0	1	0	0	yes
Chickweed, Greater	*Stellaria neglecta*	0	0	0	1	0	0	0	0	0	0	0	0	no
Chicory	*Cichorum intybus*	0	0	0	0	0	1	1	1	1	0	0	0	yes
Cinquefoil, Creeping	*Potentilla reptans*	0	0	0	0	0	1	1	1	1	1	0	0	yes
Cleavers	*Galium aparine*	0	0	1	1	1	1	1	0	0	0	0	0	yes
Clover, Red	*Trifolium pratense*	0	0	1	1	1	1	1	1	1	1	1	1	yes
Clover, Sulphur	*Trifolium ochroleucon*	0	0	0	0	0	1	0	0	0	0	0	0	no
Clover, White	*Trifolium repens*	0	0	0	0	1	1	1	1	1	1	0	0	yes
Colt's-Foot	*Tussilago farfara*	0	0	0	1	0	0	0	0	0	0	0	0	yes
Comfrey, Bulbous	*Symphytum bulbosum*	0	0	1	1	0	0	0	0	0	0	0	0	no
Comfrey, Common	*Symphetum sp.*	0	1	1	1	1	1	0	0	0	0	0	0	yes
Comfrey, Russian	*Symphytum x uplandicum*	0	0	0	1	0	0	0	0	0	0	0	0	no
Corncockle	*Agrostemma githago*	0	0	0	0	0	1	0	1	0	0	0	0	yes
Cornflower	*Centaurea cyanus*	0	0	0	0	0	0	1	1	0	1	1	0	yes
Cornsalad, Keeled-fruited	*Valerianella carinata*	0	0	1	1	1	1	0	0	0	0	0	0	no
Corydalis, Yellow	*Pseudofumaria lutea*	0	0	0	0	1	1	1	1	0	0	0	1	yes
Cowslip	*Primula veris*	0	0	0	1	1	0	0	0	0	0	0	0	yes
Crane's bill, Dove's Foot	*Geranium molle*	0	0	0	0	1	1	0	0	0	0	0	0	yes
Crane's-bill, Cut Leaved	*Geranium dissectum*	0	0	0	1	1	1	1	0	0	0	0	0	yes
Crane's-bill, Druce's	*Geranium x oxonianum*	0	0	0	1	0	1	1	1	0	1	0	0	no

Crane's-bill, Dusky	*Geranium phaeum*	0	0	0	0	1	0	0	0	0	0	0	0	no
Crane's-bill, Knotted	*Geranium nodosum*	0	0	0	0	0	0	1	1	1	0	0	0	no
Crane's-bill, Meadow	*Geranium pratense*	0	0	0	0	0	1	1	0	0	0	0	0	no
Crane's-bill, Shining	*Geranium lucidum*	0	0	0	1	1	1	1	1	0	0	0	0	yes
Creeping Jenny	*Lysimachia nummularia*	0	0	0	0	0	1	1	0	0	0	0	0	yes
Cress, Land	*Barbarea verna*	0	0	0	0	0	1	0	0	0	0	0	0	no
Crocosmia	*Crocosmia crocosmiiflora*	0	0	0	0	0	0	0	1	1	0	0	0	no
Crosswort	*Cruciata laevipes*	0	0	0	0	1	0	0	0	0	0	0	0	yes
Cuckoo Flower	*Cardamine pratensis*	0	0	0	1	1	0	0	0	0	0	0	0	yes
Cuckoo Pint	*Arum maculatum*	0	0	1	1	1	0	0	0	0	0	0	0	yes
Cudweed, Marsh	*Gnaphalium uliginosum*	0	0	0	0	0	0	0	0	0	1	0	0	yes
Daffodil, Wild	*Narcissus pseudonarcissus*	0	0	1	1	0	0	0	0	0	0	0	0	yes
Daisy, Common	*Bellis perennis*	1	1	1	1	1	1	1	1	1	1	1	1	yes
Daisy, Ox Eye	*Leucanthemum vulgare*	1	0	0	0	1	1	1	1	1	1	0	1	yes
Daisy, Seaside	*Erigeron glaucus*	0	0	0	0	0	0	0	0	1	0	0	0	no
Dame's Violet	*Hesperis matronalis*	0	0	0	0	1	0	0	0	0	0	0	0	no
Dandelion	*Taraxacum sp.*	1	1	1	1	1	1	1	1	1	1	1	1	yes
Deadnettle, Red	*Lamium purpureum*	1	1	1	1	0	1	1	0	0	0	0	0	yes
Deadnettle, White	*Lamium album*	0	1	1	1	1	1	0	0	0	1	1	1	yes
Deptford Pink	*Dianthus armeria*	0	0	0	0	0	1	0	0	0	0	0	0	no
Dock, Broad-leaved	*Rumex obtusifolius*	0	0	0	0	0	1	1	0	0	0	0	0	yes
Dock, Clustered	*Rumex conglomeratus*	0	0	0	0	0	0	1	0	0	0	0	0	no
Dock, Wood	*Rumex sanguineas*	0	0	0	0	0	0	1	1	1	0	0	0	yes
Dog's Mercury	*Mercurialis perennis*	1	1	1	1	1	0	0	0	0	0	0	0	yes
Dropwort	*Oenanthe sp.*	1	0	0	0	0	0	0	0	0	0	0	0	no
Elecampane	*Inula helenium*	0	0	0	0	0	1	1	0	0	0	0	0	no
Enchanter's-nightshade	*Circaea lutetiana*	0	0	0	0	0	0	1	1	1	0	0	0	yes
Enchanter's-nightshade, Alpine	*Circaea alpina*	0	0	0	0	0	1	1	1	0	0	0	0	no
Evening Primrose	*Oenothera sp.*	0	0	0	0	0	0	0	1	1	0	0	0	no
Everlasting-Pea, Narrow-leaved	*Lathyrus sylvestris*	0	0	0	0	0	0	1	0	0	0	0	0	yes

Fat Hen	*Chenopodium album*	0	0	0	0	0	0	1	1	1	0	0	0	yes
Fennel	*Foeniculatum vulgare*	0	0	0	0	0	0	1	0	0	0	0	1	yes
Feverfew	*Tanacetum parthenium*	0	0	0	0	0	0	1	0	0	1	1	1	yes
Figwort, Common	*Scrophularia nodosa*	0	0	0	0	0	1	1	1	1	1	0	0	yes
Figwort, Water	*Scrophularia auriculata*	0	0	0	0	0	0	1	0	0	0	0	0	yes
Flax	*Linum usitatissimum*	0	0	0	0	0	0	0	1	0	0	0	0	yes
Fleabane, Canadian	*Erigeron canadensis*	0	0	0	0	0	0	1	1	1	0	0	0	no
Fleabane, Common	*Pulicaria dysenterica*	0	0	0	0	0	0	1	1	1	1	0	0	yes
Fleabane, Mexican	*Erigeron karvinskianus*	1	1	1	1	1	1	1	1	1	1	1	1	no
Forget-me-not, Changing	*Myosotis discolor*	0	0	0	0	1	0	0	0	0	0	0	0	yes
Forget-me-not, Early	*Myosotis ramosisimma*	0	0	0	0	1	0	0	0	0	0	0	0	no
Forgetmenot, Field	*Myosotis arvensis*	0	0	1	1	1	1	0	0	0	0	1	0	yes
Forget-me-not, Water	*Myosotis scorpioides*	0	0	0	0	0	1	1	1	0	0	0	0	yes
Forgetmenot, Wood	*Myosotis sylvatica*	0	1	1	1	1	1	0	0	0	0	0	0	yes
Fox and Cubs	*Pilosella aurantiaca*	0	0	0	0	0	1	0	1	1	0	0	0	no
Foxglove	*Digitalis purpurea*	0	0	0	0	1	1	1	0	1	0	0	0	yes
Fringe Cups	*Tellima grandiflora*	0	0	0	0	1	1	0	0	0	0	0	0	no
Fritillary, Snake's Head	*Fritillaria maleagris*	0	0	0	1	0	0	0	0	0	0	0	0	no
Fumitory, Common-Ramping	*Fumaria muralis*	0	0	0	1	1	1	1	0	0	0	0	0	yes
Garlic Mustard	*Alliaria petiolata*	0	0	0	1	1	1	0	0	0	0	0	0	yes
Garlic, Three Cornered	*Allium triquetrum*	1	1	1	1	1	1	0	0	0	0	0	0	no
Garlic, Wild	*Allium ursinum*	0	0	1	1	1	0	0	0	0	0	0	0	yes
Goat's Beard	*Tragopogon pratensis*	0	0	0	0	0	1	1	0	0	0	0	0	yes
Goldenrod, Canadian	*Solidago canadensis*	0	0	0	0	0	1	1	0	0	0	0	0	no
Golden-Saxifrage, Opposite Leaved	*Chrysosplenium oppositifolium*	0	0	1	1	1	0	0	0	0	0	0	0	yes
Good King Henry	*Blitum bonus-henricus*	0	0	0	0	0	0	1	0	0	0	0	0	yes
Grape Hyacinth, Broad Leaf	*Muscari latifolium*	0	0	1	1	0	0	0	0	0	0	0	0	no
Gromwell, Purple	*Lithospermum purpureocaerulium*	0	0	0	0	0	1	0	0	0	0	0	0	yes
Ground Elder	*Aegopodium podagraria*	0	0	0	0	0	0	1	0	0	0	0	0	yes
Ground Ivy	*Glechoma hederacea*	0	0	1	1	1	1	0	0	0	0	0	0	yes

Groundsel, Common	*Senecio vulgaris*	1	1	1	1	1	1	1	1	1	1	1	1	yes
Gunnera	*Gunnera sp.*	0	0	0	0	0	0	1	0	0	0	0	0	no
Hawkbit, Autumn	*Scorzoneroides autumnalis*	0	0	0	0	0	0	1	1	1	1	0	0	yes
Hawkbit, Lesser	*Leontodon saxatilis*	0	0	0	0	0	0	1	1	0	0	0	0	yes
Hawkbit, Rough	*Leontodon hispidus*	0	0	0	0	0	0	1	1	0	1	0	0	yes
Hawksbeard, Beaked	*Crepis vesicaria*	0	0	0	0	1	0	0	0	0	0	0	0	no
Hawksbeard, Smooth	*Crepis capillaris*	0	0	0	0	1	0	1	1	1	1	1	1	yes
Hawkweed, Autumn	*Hieracium sabaudum*	0	0	0	0	0	0	0	0	1	0	0	0	no
Heath, Cross-leaved	*Erica tetralix*	0	0	0	0	0	1	0	1	0	0	0	0	yes
Heath, Spring	*Erica carnea*	0	0	0	1	0	0	0	0	0	0	0	0	no
Heather, Bell	*Erica cinerea*	0	0	0	0	0	0	0	1	0	0	0	0	yes
Hellebore, Stinking	*Helleborus foetidus*	0	0	0	1	0	0	0	0	0	0	0	0	no
Helleborine, Broad-leaved	*Epipactis helleborine*	0	0	0	0	0	0	1	1	0	0	0	0	yes
Hemp-nettle, Common	*Galeopsis tetrahit*	0	0	0	0	0	0	0	0	1	0	0	0	yes
Hemp-nettle, Red	*Galeopsis angustifolia*	0	0	0	0	0	0	0	0	1	1	0	0	yes
Herb Robert	*Geranium robertianum*	1	1	1	1	1	1	1	1	1	1	1	1	yes
Hogweed	*Heracleum sphondylium*	1	0	0	0	1	1	1	1	1	1	1	1	yes
Hogweed, Giant	*Heracleum mantagazzianum*	0	0	0	0	0	0	0	0	1	0	0	0	no
Honesty, Annual	*Lunaria annua*	0	0	0	1	1	1	1	0	0	0	0	0	no
Honeysuckle	*Lonicera periclymenum*	0	0	0	0	0	1	1	1	1	0	0	0	yes
Horehound, Black	*Ballota nigra*	0	0	0	0	0	0	1	0	0	0	0	0	no
House Leek	*Sempervivum tectorum*	0	0	0	0	0	0	1	0	0	0	0	0	yes
Iris, Stinking	*Iris foetidissima*	0	0	0	0	0	1	1	0	0	0	0	0	yes
Iris, Yellow	*Iris pseudacorus*	0	0	0	0	0	1	1	0	0	0	0	0	yes
Ivy	*Hedera helix*	0	0	0	0	0	0	0	0	1	1	1	1	yes
Kale, Sea	*Crambe maritima*	0	0	0	0	1	1	1	0	0	0	0	0	yes
Knapweed, Brown	*Centauria jacea*	0	0	0	0	0	0	0	0	0	1	0	0	yes
Knapweed, Common	*Centaurea nigra*	0	0	0	0	0	1	1	1	1	1	0	0	yes
Knapweed, Greater	*Centaurea scabiosa*	0	0	0	0	0	0	0	1	0	0	0	0	yes
Knotgrass, Common	*Polygonum aviculare*	0	0	0	0	0	1	1	1	0	0	0	0	yes

Knotgrass, Equal-leaved	*Polygonum arenastrum*	0	0	0	0	0	0	1	1	1	1	0	0	no
Knotgrass, Sea	*Polygonum maritimum*	0	0	0	0	0	0	0	0	1	0	0	0	no
Lady's Mantle	*Alchemilla sp.*	0	0	0	0	0	1	0	0	0	0	0	0	yes
Leopard's Bane, Large leaf	*Doronicum grandiflorum*	0	0	0	0	1	0	0	0	0	0	0	0	no
Ling or Common Heather	*Calluna vulgaris*	0	0	0	0	0	0	0	1	0	0	0	0	yes
Loosestrife, Dotted	*Lysimachia punctata*	0	0	0	0	0	1	1	1	0	0	0	0	no
Loosestrife, Purple	*Lythrum salicaria*	0	0	0	0	0	1	1	1	1	0	0	0	yes
Lousewort, Common	*Pedicularis sylvatica*	0	0	0	1	0	0	0	0	0	0	0	0	yes
Lungwort	*Pulmonaria officinalis*	0	0	1	1	0	0	0	0	0	0	0	0	no
Madder, Wild	*Rubia peregrina*	0	0	0	0	0	1	1	1	0	0	0	0	yes
Mallow, Common	*Malva sylvestris*	0	0	0	0	0	0	1	1	0	0	0	0	yes
Mallow, Musk	*Malva moschata*	0	0	0	0	0	1	1	1	1	1	0	0	yes
Mallow, Tree	*Malva arborea*	0	0	0	1	1	1	1	1	0	0	0	0	no
Marigold, Corn	*Glebionis segetum*	0	0	0	0	0	0	1	1	1	1	1	0	no
Marigold, Marsh	*Caltha palustris*	0	0	1	1	0	0	0	0	0	0	0	0	yes
Marigold, Pot	*Calendula officinalis*	1	1	1	1	1	1	1	1	1	1	1	1	no
Marjoram, Wild	*Origanum vulgare*	0	0	0	0	0	0	1	1	0	0	1	1	yes
Mayweed, Scented	*Matricaria chamomilla*	0	0	0	0	0	0	1	0	0	0	1	0	no
Mayweed, Scentless	*Tripleurospermum inodorum*	0	0	0	0	0	1	1	1	1	1	1	0	yes
Meadow-Rue, Common	*Thalictrum flavum*	0	0	0	0	0	0	1	0	0	0	0	0	no
Meadowsweet	*Filipendula ulmaria*	0	0	0	0	0	1	1	1	0	1	0	0	yes
Medick, Black	*Medicago lupulina*	0	0	0	0	1	1	1	1	0	1	0	0	yes
Medick, Spotted	*Medicago arabica*	0	0	0	1	1	1	0	1	0	0	0	0	yes
Mind Your Own Business	*Soleirolia soleirolii*	0	0	0	1	0	0	0	0	0	0	0	0	no
Mint, Apple	*Mentha x villosa*	0	0	0	0	0	0	0	1	1	0	0	0	no
Mint, Water	*Mentha aquatica*	0	0	0	0	0	0	0	1	0	0	0	0	no
Monkey Flower	*Mimulus ringens*	0	0	0	0	0	1	0	1	0	0	0	0	no
Monkeyflower, Common	*Erythranthre guttata*	0	0	0	0	0	0	0	1	0	0	0	0	no
Monkshood	*Aconitum sp.*	0	0	0	0	0	0	0	0	1	0	0	0	yes
Moschatel	*Adoxa moschatellina*	0	0	0	1	0	0	0	0	0	0	0	0	yes

Mouse-ear, Common	*Cerastium fontanum*	0	0	0	1	1	1	1	1	1	1	0	0	no
Mouse-Ear, Sticky	*Cerastium glomeratum*	0	0	0	1	1	0	1	0	0	0	0	0	yes
Mugwort	*Artemisia vulgare*	0	0	0	0	0	0	1	1	0	0	0	0	yes
Mullein, Dark	*Verbascum nigrum*	0	0	0	0	0	0	1	0	0	0	0	0	yes
Mullein, Great	*Verbascum thapsus*	0	0	0	0	0	0	1	0	0	0	0	0	yes
Mustard, Black	*Brassica nigra*	0	0	0	0	1	1	0	1	0	0	0	0	no
Mustard, Hedge	*Sisymbrium officinale*	0	0	0	1	1	1	1	1	0	0	0	0	yes
Mustard, Hoary	*Hirschfeldia incana*	0	0	0	0	0	0	0	1	0	1	0	0	no
Mustard, Treacle	*Erysimum cheiranthoides*	0	0	0	0	0	0	1	1	0	0	0	0	no
Mustard, White	*Sinapis alba*	0	0	0	0	1	1	1	1	1	0	1	0	yes
Nettle, Common	*Urtica dioica*	0	0	0	1	1	1	1	1	1	1	1	0	yes
Nightshade, Black	*Solanum nigrum*	0	0	0	0	0	0	1	1	1	1	1	1	yes
Nipplewort	*Lapsana communis*	1	0	1	1	1	1	1	1	1	1	1	1	yes
Old Man's Beard	*Clematis vitalba*	0	0	0	0	0	0	1	1	0	0	0	0	yes
Onion, Wild	*Allium vinneale*	0	0	0	0	0	0	1	0	0	0	0	0	yes
Orache, Common	*Atriplex patula*	0	0	0	0	0	1	1	1	0	1	0	0	yes
Orache, Spear-leaved	*Atriplex prostrata*	0	0	0	0	0	0	0	1	0	0	0	0	no
Orchid, Bee	*Ophrys apifera*	0	0	0	0	0	1	0	0	0	0	0	0	yes
Orchid, Common Spotted	*Dactylorhiza fuchsii*	0	0	0	0	1	1	1	0	0	0	0	0	no
Orchid, Common Twayblade	*Neottia ovata*	0	0	0	0	1	1	0	0	0	0	0	0	yes
Orchid, Early Purple	*Orchis mascula*	0	0	0	1	1	0	0	0	0	0	0	0	yes
Orchid, Southern Marsh	*Dactylorhiza praetermissa*	0	0	0	0	1	1	1	0	0	0	0	0	no
Orpine	*Sedum telephium*	0	0	0	0	0	0	0	1	0	0	0	0	yes
Oxtongue, Bristly	*Helminthotheca echioides*	1	0	0	0	1	1	1	1	1	1	1	0	yes
Oxtongue, Hawkweed	*Picris hieraciodes*	0	0	0	0	0	0	0	0	0	1	1	1	yes
Pale Yellow-eyed Grass	*Sysirinchium striatum*	0	0	0	0	0	0	1	0	0	0	0	0	no
Parsley, Cow	*Anthriscus sylvestris*	1	0	1	1	1	1	0	1	0	0	0	0	yes
Parsley, Fool's	*Aethusa cynapium*	0	0	0	0	0	0	1	0	1	0	0	0	yes
Parsley, Stone	*Sison amomum*	0	0	0	0	0	0	1	1	0	0	0	0	yes
Parsley, Upright Hedge	*Torilis japonica*	1	0	0	0	0	0	0	0	0	0	0	0	yes

Parsnip, Wild	*Pastinaca sativa*	0	0	0	0	0	1	1	0	0	0	0	0	no
Pearlwort, Procumbent	*Sagina procumbens*	0	0	0	0	1	1	1	0	0	0	0	0	yes
Pellitory of the Wall	*Parietaria judaica*	0	0	0	0	1	1	1	1	0	1	1	0	yes
Pennywort, Wall	*Umbilicus rupestris*	0	0	0	0	1	1	1	1	0	0	0	0	yes
Periwinkle, Greater	*Vinca major*	1	0	1	1	1	1	1	1	0	0	0	0	yes
Periwinkle, Lesser	*Vinca minor*	1	1	1	1	1	1	1	0	0	0	0	0	yes
Persicaria, Pale	*Persicaria lapathifolia*	0	0	0	0	0	0	1	1	1	0	0	0	yes
Pickerelweed	*Pontederia cordata*	0	0	0	0	0	0	1	0	0	0	0	0	no
Pignut	*Conopodium majus*	0	0	0	0	1	0	0	1	1	0	0	0	yes
Pimpernel, Scarlet	*Lysimachia arvensis*	0	0	0	0	1	1	1	1	0	1	0	0	yes
Pimpernel, Yellow	*Lysimachia nemorum*	0	0	0	0	1	0	0	0	0	0	0	0	yes
Pineapple Weed	*Matricaria discoides*	0	0	0	0	0	1	1	1	0	1	1	0	no
Pink, Carthusian	*Dianthus carthusianorum*	0	0	0	0	0	0	0	0	0	1	1	0	no
Plantain, Buck's-horn	*Plantago coronopus*	0	0	0	1	1	1	1	1	0	0	1	0	yes
Plantain, Greater	*Plantago Major*	0	0	0	0	0	0	1	1	1	0	0	0	yes
Plantain, Ribwort	*Plantago lanceolata*	0	0	1	1	1	1	1	1	1	1	0	0	yes
Ploughman's Spikenard	*Inula conyzae*	0	0	0	0	0	0	1	0	0	0	0	0	yes
Pondweed, Cape	*Aponogeton distachyos*	0	0	1	1	0	0	0	0	0	0	0	0	no
Poppy, Common	*Papaver rhoeas*	0	0	0	0	0	1	1	0	0	0	0	0	no
Poppy, Yellow Horned	*Glaucium flavum*	0	0	0	0	0	1	1	1	1	1	0	0	no
Primrose	*Primula vulgaris*	1	1	1	1	1	0	0	0	0	0	0	1	yes
Purple Salsify	*Tragopogon porrifolius*	0	0	0	0	0	0	1	0	0	0	0	0	no
Purslane, Pink	*Claytonia sibirica*	0	0	1	1	0	1	0	1	0	0	0	0	no
Ragged Robin	*Silene flos-cuculi*	0	0	0	0	0	1	0	1	0	1	1	0	yes
Ragwort, Common	*Jacobaea vulgaris*	1	1	0	0	0	1	1	1	1	1	0	1	yes
Ragwort, Oxford	*Senecio squalidus*	0	0	0	0	0	0	0	0	0	1	0	0	no
Ragwort, Silver	*Jaconaea maritima*	0	0	0	0	0	1	1	1	0	1	0	0	no
Raspberry	*Rubus idaeus*	0	0	0	0	0	0	1	0	0	0	0	0	yes
Redshank	*Persicaria maculosa*	0	0	0	0	0	1	1	1	1	1	1	0	yes
Restharrow, Common	*Ononis repens*	0	0	0	0	0	1	1	0	0	0	0	0	yes

Rose	*Rosa sp.*	0	0	0	0	0	1	1	0	0	0	0	0	yes
Rose, Field	*Rosa arvensis*	0	0	0	0	0	0	1	0	0	0	0	0	yes
Rose, Japanese	*Rosa multiflora*	0	0	0	0	0	0	1	1	0	0	0	0	no
Sage, Wood	*Teucrium scorodonia*	0	0	0	0	0	1	1	1	1	0	0	0	yes
Samphire, Rock	*Crithmum maritimum*	0	0	0	0	0	1	1	1	1	1	0	0	yes
Sanicle	*Sanicula europaea*	0	0	0	0	1	1	0	0	0	0	0	0	yes
Scabious, Field	*Knautia arvensis*	0	0	0	0	0	0	0	1	0	0	0	0	yes
Scurvygrass, Danish	*Cochlearia danica*	0	0	1	1	1	1	1	0	0	0	0	0	no
Sea Beet	*Beta vulgaris ssp. Maritima*	0	0	0	1	1	1	1	1	0	0	0	0	yes
Sea-spurrey, Rock	*Spergularia rupicola*	0	0	0	0	0	1	1	1	0	1	0	0	no
Selfheal	*Prunella vulgaris*	0	0	0	0	1	1	1	1	1	1	1	0	yes
Shepherd's Purse	*Capsella bursa-pastoris*	0	0	1	1	1	1	1	1	0	0	0	1	yes
Skunk Cabbage, American	*Lysichiton americanus*	0	0	1	1	0	0	0	0	0	0	0	0	no
Snowdrop	*Galanthus nivalis*	1	1	1	0	0	0	0	0	0	0	0	0	yes
Snowdrop, Greater	*Galanthus elwessii*	1	0	0	0	0	0	0	0	0	0	0	0	no
Snowflake, Summer	*Leucojum aestivum*	1	0	1	0	0	0	0	0	0	0	0	0	no
Soldier, Shaggy	*Galinsoga quadriradiata*	0	0	0	0	0	0	0	0	0	1	0	0	no
Solomon's Seal	*Polygonatum sp.*	0	0	0	0	1	0	0	0	0	0	0	0	yes
Sorrel, Common	*Rumex acetosa*	0	0	0	1	1	1	0	0	0	0	0	0	yes
Sorrel, Least Yellow	*Oxalis exilis*	0	0	0	0	0	0	0	1	0	1	0	0	no
Sorrel, Pale Pink	*Oxalis incarnata*	0	0	0	1	0	0	0	0	0	1	0	0	no
Sorrel, Procumbent Yellow	*Oxalis corniculata*	0	0	0	1	1	1	1	1	0	0	0	0	yes
Sorrel, Sheep's	*Rumex acetosella*	0	0	0	0	1	0	0	0	0	0	0	0	yes
Sorrel, Wood	*Oxalis acetosella*	0	0	0	1	0	0	0	0	0	0	0	0	yes
Sour Fig	*Carpobrotus edulis*	0	0	0	1	1	1	1	0	0	0	0	0	no
Sow Thistle, Smooth	*Sonchus oleraceus*	1	1	1	1	1	1	1	1	1	1	1	1	yes
Sowbread	*Cyclamen hederifolium*	0	0	0	0	0	0	0	0	0	1	0	0	no
Sow-thistle, Perennial	*Sonchus arvensis*	0	0	0	0	0	1	1	1	0	0	0	0	yes
Sow-thistle, Prickly	*Sonchus asper*	0	0	0	0	1	1	1	1	0	1	1	1	no
Spearwort, Greater	*Ranunculus lingua*	0	0	0	0	0	1	0	0	0	0	0	0	yes

Speedwell, Common Field	*Veronica persica*	1	1	1	1	1	1	1	1	1	0	0	1	yes
Speedwell, Germander	*Veronica chamaedris*	0	1	1	1	1	1	1	1	0	0	1	0	yes
Speedwell, Ivy-Leaved	*Veronica hederifolia*	0	0	1	1	1	0	0	0	0	0	0	0	yes
Speedwell, Pink Ivy-leaved	*Veronica sublobata*	0	0	0	1	1	0	0	0	0	0	0	0	no
Speedwell, Slender	*Veronica filiformis*	0	0	1	1	1	0	0	0	0	0	0	0	no
Speedwell, Thyme-leaved	*Veronica serpyllifolia*	0	0	0	1	1	0	0	1	0	1	1	1	yes
Speedwell, Wall	*Veronica arvensis*	0	0	0	0	1	1	1	0	0	0	0	0	yes
Speedwell, Wood	*Veronica montana*	0	0	0	0	1	1	0	0	0	0	0	0	yes
Spurge, Petty	*Euphorbia peplus*	1	1	1	1	1	1	1	1	1	1	1	1	yes
Spurge, Upright	*Euphorbia stricta*	0	0	0	0	0	1	0	0	0	0	0	0	no
Spurge, Wood	*Euphorbia amygdaloides*	0	0	0	1	1	0	0	0	0	0	0	0	no
Squill, Siberian	*Scilla siberica*	0	0	1	0	0	0	0	0	0	0	0	0	no
St John's Wort, Hairy	*Hypericum hirsutum*	0	0	0	0	0	0	1	1	0	0	0	0	no
St John's Wort, Pale	*Hypericum montanum*	0	0	0	0	0	0	1	0	0	0	0	0	yes
St John's Wort, Perforate	*Hypericum perforatum*	0	0	0	0	0	1	1	1	0	0	0	0	yes
St John's Wort, Squ. stemmed	*Hypericum tetrapterum*	0	0	0	0	0	0	0	1	0	0	0	0	yes
St Johns Wort, Tutsan	*Hypericum androsaemum*	0	0	0	0	1	1	1	0	1	0	0	0	yes
St John's-wort, Wavy	*Hypericum undulatum*	0	0	0	0	0	0	0	0	1	0	0	0	no
Star of Bethlehem	*Ornithogalum umbellatum*	0	0	0	0	1	0	0	0	0	0	0	0	yes
Stitchwort, Bog	*Stellaria alsine*	0	0	0	0	1	0	0	0	1	0	0	0	yes
Stitchwort, Greater	*Stellaria holostea*	0	0	1	1	1	0	0	0	0	0	0	0	yes
Stitchwort, Lesser	*Stellaria graminea*	0	0	0	0	1	1	1	1	1	1	1	0	yes
Stitchwort, Marsh	*Stellaria palustris*	0	0	0	0	1	0	0	0	1	0	0	0	no
Stonecrop, Biting	*Sedum acre*	0	0	0	0	0	1	1	0	0	0	0	0	yes
Stonecrop, White	*Sedum album*	0	0	0	0	0	1	1	0	0	0	0	0	no
Strawberry, Barren	*Fragaria sterilis*	1	1	1	1	0	0	0	0	0	0	0	0	no
Strawberry, Wild	*Fragaria vesca*	0	0	0	1	1	1	1	1	1	1	0	0	yes
Sweet Cicely	*Myrrhis odorata*	0	0	0	0	1	0	0	0	0	0	0	0	no
Swinecress, Lesser	*Lepidium didymum*	0	0	0	0	0	1	1	1	0	0	0	0	yes
Tansy	*Tanacetum vulgare*	0	0	0	0	0	0	1	1	0	0	0	0	yes

Tare, Hairy	*Vicia hirsuta*	0	0	0	0	1	1	1	1	0	0	0	0	yes
Tare, Smooth	*Vicia tetrasperma*	0	0	0	0	0	1	1	1	0	1	0	0	yes
Teasel	*Dipsacus fullonum*	0	0	0	0	0	0	0	0	1	0	0	0	yes
Thale Cress	*Arabidopsis thaliana*	0	1	1	1	0	0	0	0	0	0	0	0	yes
Thistle, Creeping	*Cirsium arvense*	0	0	0	0	0	1	1	1	1	1	0	0	yes
Thistle, Marsh	*Cirsium palustre*	0	0	0	0	0	1	1	1	1	0	0	0	yes
Thistle, Melancholy	*Cirsium heterophyllum*	0	0	0	0	0	1	0	0	0	0	0	0	no
Thistle, Spear	*Cirsium vulgare*	0	0	0	0	0	1	1	1	1	0	1	0	yes
Thrift, Sea	*Armeria maritima*	0	0	1	1	1	1	1	1	0	1	0	0	yes
Toadflax, Common	*Linaria vulgaris*	0	0	0	0	0	0	1	1	1	1	0	0	yes
Toadflax, Ivy-Leaved	*Cymbalaria muralis*	1	1	1	1	1	1	1	1	1	1	1	1	yes
Toadflax, Pale	*Linaria repens*	0	0	0	0	0	0	1	0	0	0	0	0	no
Toadflax, Purple	*Linaria purpurea*	0	0	0	0	0	1	1	1	1	1	0	0	no
Toothwort, Purple	*Lathraea clandestina*	0	0	1	1	0	0	0	0	0	0	0	0	no
Tormentil	*Potentilla erecta*	0	0	0	0	1	1	0	0	0	1	0	0	yes
Trefoil, Bird's-foot	*Lotus corniculatus*	0	0	0	1	1	1	1	1	1	0	0	0	yes
Trefoil, Greater Bird's-foot	*Lotus pedunculatus*	0	0	0	0	0	0	1	1	1	0	0	0	yes
Trefoil, Large	*Trifolium aureum*	0	0	0	0	0	0	0	1	0	0	0	0	no
Trefoil, Lesser	*Trifolium dubium*	0	0	0	0	1	1	0	1	0	0	0	0	no
Valerian, Red	*Centranthus ruber*	0	0	0	1	1	1	1	1	1	1	1	0	no
Vetch, Bush	*Vicia sepum*	1	1	1	1	0	1	1	1	1	1	1	1	yes
Vetch, Common	*Vicia sativa*	0	0	0	1	1	1	1	1	0	0	0	0	yes
Vetch, Common Kidney	*Anthyllis vulneraria*	0	0	0	0	0	1	1	1	0	0	0	0	yes
Vetch, Tufted	*Vicia cracca*	1	0	1	0	0	1	1	1	0	0	0	0	yes
Vetch, Wood	*Vicia sylvatica*	0	0	0	0	0	0	1	0	0	0	0	0	no
Vetchling, Grass	*Lathyrus nissolia*	0	0	0	0	0	1	1	0	0	0	0	0	yes
Vetchling, Meadow	*Lathyrus pratensis*	0	0	0	0	0	1	1	1	0	1	0	0	no
Violet, Common Dog	*Viola riviniana*	0	0	1	1	1	0	0	0	0	1	0	0	yes
Violet, Early Dog	*Viola reichenbachiana*	0	0	1	1	1	0	0	0	0	0	0	0	no
Violet, Sweet	*Viola odorata*	1	1	1	0	0	0	0	0	0	0	0	0	yes

Wall-rocket, Annual	*Diplotaxis muralis*	0	0	0	0	0	1	1	1	1	1	1	0	no
Watercress	*Nasturtium officinale*	0	0	0	0	0	1	0	1	0	1	0	0	no
Water-Crowfoot, Common	*Ranunculus aquatilis*	0	0	0	0	0	0	0	1	0	0	0	0	no
Water-crowfoot, River	*Ranunculus fluitans*	0	0	0	0	0	0	1	1	0	0	0	0	yes
Water-dropwort, Corky-fruited	*Oenanthe pimpinelloides*	0	0	0	0	0	1	1	0	0	0	0	0	no
Water-Dropwort, Hemlock	*Oenanthe crocata*	0	0	1	1	1	1	0	0	0	0	0	0	yes
Waterpepper	*Persicaria hydropiper*	0	0	0	0	0	0	0	0	1	0	0	0	yes
Willowherb, American	*Epilobium ciliatum*	0	0	0	0	0	0	1	1	1	1	0	0	no
Willowherb, Broad-leaved	*Epilobium montanum*	0	0	0	0	0	1	1	1	0	0	0	0	yes
Willowherb, Greater	*Epilobium hirsutum*	0	0	0	0	0	1	1	1	1	0	0	0	yes
Willowherb, Hoary	*Epilobium parviflorum*	0	0	0	0	0	1	1	1	0	0	0	0	yes
Willowherb, Marsh	*Epilobium palustre*	0	0	0	0	0	0	1	1	1	0	0	0	yes
Willowherb, Rosebay	*Chamaenerion angustifolium*	0	0	0	0	0	0	1	1	1	0	0	0	no
Willowherb, Short-fruited	*Epilobium obscurum*	0	0	0	0	0	0	0	1	1	0	0	0	no
Willowherb, Spear-leaved	*Epilobium lanceolatum*	0	0	0	0	0	0	1	0	0	1	0	0	no
Willowherb, Square-stalked	*Epilobium tetragonum*	0	0	0	0	0	0	1	0	0	0	0	0	yes
Winter Aconite	*Eranthis hyemalis*	1	1	0	0	0	0	0	0	0	0	0	0	no
Winter Heliotrope	*Petasites fragrans*	1	1	1	0	0	0	0	0	0	0	0	1	no
Wintercress, Common	*Barbarea vulgaris*	0	0	0	0	0	1	0	0	0	0	0	0	no
Woodruff, Sweet	*Galium odoratum*	0	0	0	0	1	1	0	0	0	0	0	0	yes
Woundwort, Hedge	*Stachys sylvatica*	0	0	0	0	0	1	1	1	1	1	1	0	yes
Woundwort, Marsh	*Stachys palustris*	0	0	0	0	0	1	1	1	1	0	0	0	yes
Yarrow	*Achillea millefolium*	1	0	0	0	1	1	1	1	1	1	1	1	yes
Yellow Archangel	*Lamium galeobdolon*	0	0	1	1	1	0	0	0	0	0	0	0	yes
Yellow Rattle	*Rhinanthus minor*	0	0	0	0	0	1	1	1	0	0	0	0	yes

Grasses, Rushes and Sedges

Barley, Wall	*Hordeum murinum*	0	0	0	0	1	1	1	1	0	0	0	0	yes
Cock's foot	*Dactylis glomerata*	0	0	0	0	1	1	1	1	0	0	0	0	yes

Creeping Bent	*Agrostis stolonifera*	0	0	0	0	0	0	1	0	0	0	0	0	no
Crested Dog's-tail	*Cynosurus cristatus*	0	0	0	0	0	0	1	0	0	0	0	0	yes
False Brome	*Brachypodium sylvaticaum*	0	0	0	0	0	0	1	0	0	0	0	0	yes
False Oat-grass	*Arrhenatherum elatius*	0	0	0	0	0	0	1	0	0	0	0	0	no
Fescue, Giant	*Lolium giganteum*	0	0	0	0	1	0	0	0	0	0	0	0	no
Fescue, Red	*Festuca rubra*	0	0	0	1	0	1	0	0	0	0	0	0	yes
Foxtail, Meadow	*Alopecurus pratensis*	0	0	0	1	1	1	0	0	0	0	0	0	yes
Meadow Grass, Annual	*Poa annua*	0	0	1	1	1	1	0	0	0	0	0	0	yes
Meadowgrass, Smooth	*Poa pratensis*	0	0	0	0	0	1	0	0	0	0	0	0	yes
Meadow-grass, Wood	*Poa nemoralis*	0	0	0	0	0	0	1	0	0	0	0	0	no
Moor Grass, Purple	*Molinia caerulia*	0	0	0	0	0	1	0	0	0	0	0	0	no
Reed, Common	*Phragmites australis*	0	0	0	0	0	0	0	1	1	0	0	0	yes
Timothy-grass	*Phleum pratense*	0	0	0	0	0	0	1	0	0	0	0	0	yes
Vernal Grass, Sweet	*Anthoxanthum odoratum*	0	0	0	0	1	0	0	0	0	0	0	0	yes
Yorkshire Fog	*Holcus lanatus*	0	0	0	0	0	0	1	0	0	0	0	0	yes
Rush, Soft	*Juncus effusus*	0	0	0	0	1	1	1	0	0	0	0	0	yes
Woodrush, Field	*Luzula campestris*	0	0	1	1	1	0	0	0	0	0	0	0	yes
Woodrush, Great	*Luzula sylvestris*	0	0	1	1	0	0	0	0	0	0	0	0	yes
Sedge, Pendulous	*Carex pendula*	0	0	0	1	1	1	1	0	0	0	0	0	yes
Sedge, Remote	*Carex remota*	0	0	0	0	1	0	0	0	0	0	0	0	yes
Sedge, Wood	*Carex sylvatica*	0	0	0	0	1	0	0	0	0	0	0	0	yes