Parish flora change 1920-2018
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Change in the wild flora of Brockweir, Hewelsfield and St Briavels

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Our wild flora is changing rapidly. At the national scale, 20 native species have become extinct (Plantlife), whilst numerous non-native species have 'jumped the garden fence' and established themselves as self-perpetuating populations. A glance at the *Atlas of the British Flora* quickly reveals that populations of many more native species have thinned out in the intensively farmed lowlands and some have become regionally extinct. Peter Marren alerted us to the 20th century extinction rates of around one species each year at the scale of vice-counties, though these have since been revised downwards to rates of 0.25-0.84 species per annum for a range of southern and Midlands counties (Walker). Further, extinction rates accelerated during the 20th century, except in vice-counties where major habitat destruction happened earlier, e.g., Cambs (Walker, Preston).

But, these are large scale perspectives. Enclaves remain where habitats have not been destroyed wholesale, where one might reasonably wonder whether the wild flora has bucked the wider trends. One such district is the Lower Wye Valley, where native woodland on steep slopes continues to dominate the landscape; few fields are ploughed; hedges, green lanes and flower-rich grasslands remain common; small, deeply-incised streams descend into the Wye; and fragments of former common heaths and common woodland survive. Surely, in a place like this, the native wild flora has remained intact and neophytes have not infiltrated far.

We put these hopeful suppositions to the test in the parishes of Hewelsfield and St Briavels, which run up from the Wye floodplain across bands of sandstone and Quartz Conglomerate to the Carboniferous limestone plateau on the fringes of the Forest of Dean (Glos). The western parts are, and have always been, very well wooded, and even the parts that are not technically woodland comprise tiny fields with large hedges and boundary trees formed out of wooded commons, permeated by a dense network of green lanes. The eastern half is more arable than pasture, but there are concentrations of woodland and small fields around Rodmore Mill. The largest villages are St Briavels and Brockweir, but houses are scattered throughout the western parts.

Our test compared a list of the vascular plants present in the combined parishes a century ago with a list of all the species we could find in 2017-2018. We searched the many public places and, being residents, enjoyed access to a good deal of private ground as well. Moreover, we enlisted other residents to search for the rare, but recognisable species, such as harebell.

The *Flora of Chepstow*

The *Flora of Chepstow* (Shoolbred 1920) was compiled by a physician who lived in Chepstow from 1878 to 1928. In the words of the Glos Flora (1948), he was 'one of the best systematic botanists … of his day … a careful, critical and enthusiastic collector of all the most difficult genera [who] was always careful in the matter of rare plants.' One imagines him cycling and walking up to 15 miles out into the Chepstow hinterland scouring the district for vascular plants and bryophytes. His *Flora* is a masterpiece of succinct, no-nonsense summary, with little background information, no illustrations, no synthesis and indeed no index. It clearly distinguishes the species of Gloucestershire from those in Monmouthshire, gives the frequency of each species and their main habitats; includes records made by other observers; and mentions particular localities for the less-common species. The frequency of almost all species in the two counties combined is indicated by a DAFOR scale.

The *Flora*, one assumes, includes all the species he found, but inevitably it is limited by the taxonomy of the day and shaped by his personal interests. He recorded only one species of polypody, but three species are now recognised. He had a strong interest in the numerous microspecies of brambles and knew the bramble experts of the day, who happened to live nearby. He recorded some introduced species, but botanists were then less interested in these than they are today, so they may have been under-recorded. We have 'translated' his records into modern terms by, for example, counting the 'very common' P**olypody** as two species in the parishes, ***Polypodium interjectum* and *P. vulgare s.s.***, and ignoring microspecies of **Brambles, Hawkweeds** and **Dandelions**.

Flora and habitats before 1920

The *Flora* gives locations within the parishes for 123 species (and 20 microspecies of **bramble**), the great majority of which were natives. On the whole, these were rare or infrequent. For many he gave individual localities.

This leaves a large problem: how does one complete the species list for the parishes from descriptions that apply either to the whole hinterland of Chepstow or to the Gloucestershire part of that hinterland? In the absence of any other information, we have assessed the balance of probabilities from Shoolbred's descriptions and general ecological knowledge. Thus, **Dandelion *Taraxacum officinale* agg**. was 'very common in grassy places', and we can safely assume that it grew in our parishes. In fact, in this case, it would have been miraculously remarkable if it had not. On the other hand, there is much less certainty about, say, **small scabious *Scabiosa columbaria***, which was 'frequent on limestone banks, quarry bases and old walls', all of which were present in the parishes. In these instances, we have counted the dandelion as part of the parish's flora, but left the scabious on the list of 'possibles'.

On this basis, a further 372 species have been included in the parish flora of 1920, with a reserve list of 90 possibles: thus the parishes certainly or probably contained 495 species, but it might have been up to 585 species. However, that list will still be incomplete: even Shoolbred will not have found every rare species within his area of search. Of the 495, 431 are natives, 49 are species that were introduced before 1500 ('archaeophytes') and 15 were introduced after 1500 ('neophytes'). If we take the maximum list, the figures are 504 natives, 61 archaeophytes and 20 neophytes.

Most of these species were found in more than one habitat. For a few of the 123 species that explicitly grew within the parishes, we know the exact habitat(s) they occupied within the parishes, but generally we know only each species' habitat preferences in the Chepstow hinterland as a whole. When, for example, a species was said to grow in pasture and woods, we can only assume that these were the habitats it occupied in our parishes.

On this basis, woods (223 species) and hedges (159) held the most species with pasture (107), meadow (54), heath (40), walls (65) and cultivated fields (55) some distance to the rear. Water bodies contributing in a variety of ways (river Wye 51; ponds 30; brooks, ditches and streams 52) and there were a few species in bogs (11) and on rocks (14). Marginal habitats were important, not just hedges, but also 'banks' (129), railways (8) and roadsides (47). In addition to the actual watercourses and bog, wet ground was important qualifier for several habitats (34).

Old photographs show that the landscape was tidier and less arborescent than it is now: the hedges were more trimmed and the woods and boundary trees were less prominent. The woods were still being coppiced and the fields were largely under grass, much of it pasture, but also some meadows.

Flora in 2017-2018 and overall change since 1920

In 2017 and 2018, with some help from other residents, we set out to find all the wild-growing species in the parishes, and by mid September 2018 we had found 503 species. Species were defined on the same basis as in 1920, except that 4 hybrids between native species were also counted as 'species'. A few species were being found for the first time in early September, but by then we were subject to the law of diminishing returns: it was hard to add any, and the season was running into autumn. We have a list of [25] species that we expected to find, but did not, but for analysis we have taken the list at face value.

Using the 495 species as our 1920 baseline, [80] species have been lost and [88] species have been gained. Botanical surveys on this scale are never complete, so the turnover has probably been less substantial than it seems. Thus if we missed 30 species that are actually present, both the 'gains' and 'losses' would be smaller. And, if some of the 90 species possibly present in 1920 are were actually present, the losses would be greater and the gains fewer. In short, the number of wild-growing species in the parishes is roughly the same as it was a century ago, but the constituent species have changed.

We can also detect declines and increases in species that were present at both dates by comparing the Shoolbred record of frequency and habitats with our 2017-8 observations. This is a qualitative exercise, but it gives a sharper understanding than simple statistics of what has happened.

Gains in the flora

Species can be added by finding species that were actually present in 1920, but were overlooked; by immigrating; by forming new hybrids; and by recognising new species when the taxonomy of a genus is changed.

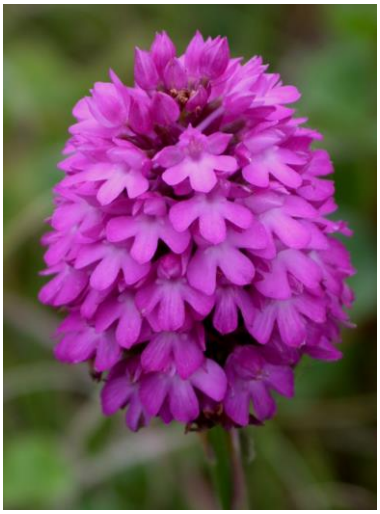
Of these, the last two are 'niche' reasons and will be rare or non-existent. We largely eliminated the last by converting the 1920 list to modern taxonomy. The main issue is which species are actually new arrivals, and which were here all the time, and in the absence of other information, the question becomes a matter of judgement. The five **hybrids** added were D**ock *Rumex pratensis*, Sallow *Salix reichardtii*, Woundwort *Stachys ambigua*, Apple-mint *Mentha smithiana*, Russian Comfrey *Symphytum uplandicum*.**, though the willow, a hybrid between ***S. caprea*** and ***S. cinerea***, was probably present in 1920. Some 48 **neophytes** were recorded in 2017-8, of which two were mentioned in 1920 and might have been present, **Gooseberry *Ribes-uva-crispa*** ('escape, hedges and woods') and **Red Valerian *Centranthus ruber*** ('locally abundant, old walls'), but the other 46 must be recent escapes. They include several now-notorious species (**Japanese Knotweed *Fallopia japonica*, Cherry Laurel *Prunus laurocerasus*, Indian Balsam *Impatiens glandulifera*, Spanish Bluebell** hybrid ***Hyacinthoides x massartiana***); some welcome additions (**Celandine Saxifrage *Saxifraga cymbalaria*, Fox-and Cubs *Pilosella aurantiaca*, Greater Cuckooflower *Cardamine raphanifolia***) and one species that just might include a native population (**Snowdrop *Galathus nivalis*)**.

Greater Cuckooflower in a stream near Rodmore Mill

Then there are 9 **archaeophytes**, some at least of which may have been present in 1920. Most are species of disturbed ground (**Many-seeded Goosefoot *Chenopodium polyspermum,* Fig-leaved Goosefoot *C.ficifolium,* Lesser Swine-cress *Coronopus didymus,* Swine-cress *C.squamatus,* Cornflower *Centaurea cyanus,* Bristly Oxtongue *Picris echioides,* Black-grass *Alopecurus myosuroides and* Chickory *Cicorium intybus)***, but one (**Lesser Periwinkle *Vinca minor)*** has established itself in woods and hedges.

The rest are species **native** to Britain. Of these, 4 had not previously been recorded in 32/50, namely **Curled Dock *Rumex crispus ssp uliginosus,* Reflexed Saltmarsh-grass *Puccinellia distans,* Narrow-leaved Meadow-grass *Poa angustifolia and* Sea Fern-grass *Catapodium marinum***. **Reflexed Saltmarsh-grass** spread in response to salt treatment of roads, but the others may have been overlooked in 1920. The rest had been recorded in 32/50 by the Atlas, which means they were in the parishes or nearby. Seven species had not been recorded in 32/50 since the 1980s, of which 5 were associated with water (**Pink Water-speedwell *Veronica catenata,* Broad-leaved Pondweed *Potamageton natans,* Small Pondweed *P.bechtoldii,* Greater Duckweed *Spirodela polyrhiza,* Wood Club-rush *Scirpus sylvaticus***) and two others (**Bifid Hemp-nettle *Galeopsis bifida,* Spreading Meadow-grass *Poa humilis***).

Finally, we have 36 native species which were judged to be outside the parishes in 1920, but which could easily have been present. They include three orchids (**Broad-leaved Helleborine *Epipactis helleborine,* Pyramidal Orchid *Anacamptis pyramidalis,* Bee Orchid *Ophrys apifera***), riverside plants that may well have extended into the parishes (**Sea Aster *Aster tripolium,* Flowering-rush *Butomus umbellatus,* Lesser Pond-sedge *Carex acutiformis,* Yellow Loosetrife *Lysimachia vulgaris,* Bristle Club-rush *Isolepis setacea,* Water Chickweed *Myosoton aquaticum***) and infrequent species of woodland, heath and grassland species (**Wood Small-reed *Calamagrostis epigeios,* Crab Apple *Malus sylvestris,* Climbing Corydalis *Ceratocapnos claviculata,* Lesser Hawkbit *Leontodon saxatilis***). There is simply no telling whether that were present in 1920, but we suspect most were.



Pyramidal orchid. A single plant flowered on the road verge near g
the Hewelsfield crossroads

General conclusion: many neophytes have established themselves in the parishes, but most -not all - of the apparently-new archaeophytes and native species were probably here all the time.

Losses from the flora

Of the 123 species recorded explicitly from the parishes, 55 were not been found in 2017-8. They include three species that were common in 1920, **Hairy Rock-cress *Arabis hirsuta,* Eyebright *Euphrasia rostkoviana*** and **Almond Willow *Salix triandra***, and three more that were fairly common, **Narrow Buckler-fern *Dryopteris carthusiana,* Alder Buckthorn *Frangula alnus*** and **Lemon-scented Fern *Oreopteris limbosperma***. The proportion of losses from the 372 species that were probably within the parishes in 1920 was much lower, 13% (48 species), which is hardly surprising since these were mostly common and widespread in 1920. They include several that must surely be around somewhere, such as **Hairy Tare *Vicia hirsuta*** and **Marjoram *Origanum vulgare***, all common or very common in 1920. However, even if they eventually turn up, it seems highly likely that they will have declined considerably.

More species were said to grow in **woodland** than in any other habitats, which is hardly unexpected in a well-wooded district. Since 1920, the area of woodland has, if anything, increased, so one might have expected the woodland species to have survived. But, in fact, 29 species have not been found.

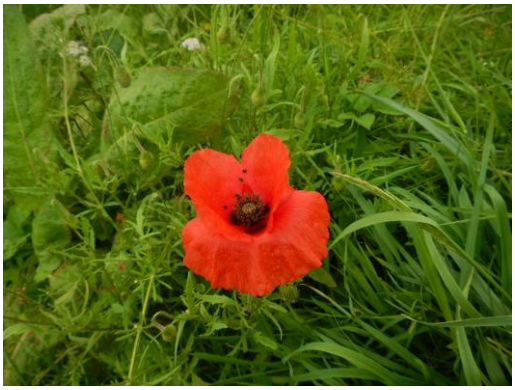
So, how do woodland species disappear if the woodlands survive? The answer is neglect of management and consequent loss of open spaces within woodland. In fact, three lost species were specifically identified with open woods in 1920, **Marjoram *Origanum vulgare,* Heather *Calluna vulgaris*** and **Saw-wort *Serratula tinctoria***, and there are other lost species normally associated with open habitats, such as **Heath Milkwort *Polygala serphyllifolia,* Field Gromwell *Lithospermum officinale,* Adder's-tongue *Ophioglossum vulgare,* Hemlock *Conium maculatum,* Small Teasel *Dipsacus pilosus,* Bell Heather *Erica cinerea,* Lady's-mantle *Alchemilla xanthochlora*** and **Crosswort *Cruciata laevipes***. All these could have been eliminated by a period of neglect, and would have difficulty returning even when management resumed. This conclusion is reinforced by many species that survived: it would now be wildly inappropriate to follow Shoolbred and describe **Harebell *Campanula rotundifolia*** and **Betony *Stachys officinalis*** as woodland species and **Common Cow-wheat *Melampyrum pratense*** and **Tormentil *Potentilla erecta*** as common species of woods, heaths and dry banks. The loss of open spaces does not explain the loss of genuine shade species, such as **Dewberry *Rubus caesius,* Oak Fern *Gymnocarpium dryopteris,* Bird's-nest Orchid *Neottia nidus-avis,* Narrow Buckler-fern *Dryopteris carthusiana,* Alternate-leaved Golden-saxifrage *Chrysosplenium alternifolium*** and **Common Wintergreen *Pyrola minor***, but they could also be victims of neglect as litter builds up and bramble and other undergrowth prospers in overgrown woodlands.


Heather. Recorded within the parishes in 1920, it has not been recorded since. Where was the local patch of heathland, like Poors' Allotment?

Some 54 species were said to grow in **meadows** in 1920, a time when meadows were still frequent and often cut by scythe. Semi-natural meadows have continued to be part of the landscape, though their extent has declined steadily - and is still declining – and they have disappeared from the limestone districts and almost disappeared from the Wye floodplain. Unsurprisingly, **Hairy-brome *Bromus racemosa,* Wild Parsnip *Pastinaca sativa,* Carnation Sedge *Carex panicea,* Pepper-saxifrage *Silaum silaus*** and several other species have not been found: **Adder's-tongue *Ophioglossum vulgatum*** and **Green-winged Orchid *Orchis morio*** remained as very small populations as late as 2000. Many others are much reduced, including species of limestone grassland (**Fairy Flax *Linum catharticum,* Quaking-grass *Briza media,* Goat's-beard *Tragapogon pratensis***), several of wet grassland (**Marsh Cudweed *Gnaphalium uliginosum,* Lesser Spearwort *Ranunculus flammula,* Marsh Ragwort *Senecio aquaticus,* Ragged-robin *Lychnis flos-cuculi,* Yellow Iris *Iris pseudacorus,* Creeping-jenny *Lysimachia nummularia,* Southern Marsh-orchid *Dactylorhiza praetermissa,* White Willow *Salix alba***) and a few of ordinary (mesic) meadows (**Pale Sedge *Carex pallescens,* Meadow Brome *Bromus commutatus,* Dyer's Greenweed *Genista tinctoria***). For example, ***Genista tinctoria*** was frequent in rough meadows in 1920, and explicitly present in Hewelsfield, but by the 1990s it was confined to a small patch in one field, where it has led a precarious existence ever since.

Much the same can be said about species of pasture, heathland, wet ground, open water and cultivated ground: several species have evidently been lost and many more seem much reduced. **Heath and bog** plants have been severely hit, with the loss of **Heather *Calluna vulgaris,* Bell Heather *Erica cinerea* , Cross-leaved Heath *Erica tetralix,* Wavy Hair-grass *Deschampsia flexuosa, Carex pulicaris,* Heath Cudweed *Gnaphalium sylvaticum*** and **Lesser Butterfly-orchid *Platanthera bifolia***, and survivors, such as **Slender St.John's-wort *Hypericum pulchrum,* Silver Hair-grass *Aira caryphyllea,* Bilberry *Vaccinium myrtillus,* Trailing St.John's-wort *Hypericum humifusum,* Eyebright *Euphrasia officinalis,* Common Milkwort *Polygala vulgaris,* Heath-grass *Danthonia decumbens,* Heath Wood-rush *Luzula multiflora,* Heath Bedstraw *Galium saxatile,* Smooth-stalked Sedge *Carex laevigata*** and **Creeping Soft-grass *Holcus mollis*** are much reduced. In addition to actual loss of habitat, this must be due to neglect of management in woodlands, under-use of grasslands, scrub overgrowth of banks and general eutrophication of the landscape.

Since 1920, much of the high ground and some of the Wye floodplain have been converted to arable, where the flora is extremely limited. Walk into the centre of a recently harvested field and one often finds literally no wild plants at all. Predictably, there have been many losses of **arable** weeds, such as **Corn Chamomile *Anthemis arvensis, Stachys arvensis,* Annua Knawel *Scleranthus annuus,* Thyme-leaved Sandwort *Arenaria serphyllifolia,* Field Madder *Sherardia arvensis,* Corn Buttercup *Ranunculus arvensis,* Long-headed Poppy *Papaver dubium,* Common Fumitory *Fumaria officinalis, Corn Spurry Spergularia arvensis,* Stinking Chamomile *Anthemis cotula*** and **Common Cudweed *Filago vulgaris***, almost all of which were at least frequent in 1920. Moreover, diligent search revealed just one **Common Poppy *Papaver rhoeas,*** a species that was common in cornfields in 1920. We have also lost several species of **waste places**, such as **Welted Thistle *Carduus crispus,* Hemlock *Conium maculatum,* Henbane *Hyoscyamus niger,* Annual Mercury *Mercurialis annua,* Bur Chervil *Anthriscus caucaulis,* Wild Parsnip *Pastinaca sativa,* Hairy Tare *Vicia hirsuta*** and **Green Field-speedwell *Veronica agrestis***.



The single poppy found in the parishes in 2018, growing in rough ground between two fields in Hewelsfield.

Review

Archaeophytes testify to a long history of floral acquisitions, whilst tantalising glimpses indicate lost native species. Thus, in 1839, William Heard Thomas, a local physician, recorded **Lady's Slipper-orchid *Cypripedium calceolus*** and **Mezereon *Daphne mezereum*** amongst a list of more credible species in the steep woods on the margins of our parishes opposite Tintern. The rate of change accelerates: in the last 20 years we have watched once common species decline and others re-appear, but only for a few years (e.g., **Early-purple Orchid *Orchis mascula,* Autumn Lady's-tresses *Spirathes spiralis***).

Despite the limitations of our survey, it seems clear that local extinctions have taken place at more than 0.5 species per annum and that acquisitions have accumulated at roughly the same pace, all in parishes that, to the superficial gaze, seem largely unchanged, still habitat-rich. The findings are sobering. Throughout the last 100 years, several habitats that have survived in quantity have become less diverse, notably woodland and grassland. Boundary habitats of several kinds were

important refuges in 1920, notably hedges and road verges, but they are now mostly stocked with a limited flora of widespread species. Niche habitats, such as bogs, wet ground, ponds and unshaded streams have gone or have been much reduced. Even the banks of the Wye have become overgrown and swamped by **Indian Balsam**. Numerous causes can be identified, but ultimately, the driving force is the change from a traditional way of life to a community dominated by commuters, teleworkers and the retired.

Does it matter? A few long-term residents notice that, once the bluebells, wood anemones and wild garlic have died back, the woods have fewer flowers. There is still plenty of colour in the countryside, even if it is **cow parsley, Indian Balsam** and the like. Despite the best efforts of the Parish Grassland Project and its members, the fields are more overgrown with **Cock's-foot** and other rank grasses. But most residents are apparently unconcerned and oblivious.

Despite the best efforts of the Parish Grasslands Project, there are fewer fields in the parishes with this intensity of colour than there were 20 years ago.

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