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Plantlife is the organisation that is speaking up for our wild flowers, plants and fungi. From the open spaces of our nature reserves to the corridors of government, we're here to raise their profile, to celebrate their beauty, and to protect their future.

Wild flowers and plants play a fundamental role for wildlife, and their colour and character light up our landscapes. But without our help, this priceless natural heritage is in danger of being lost.

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Britain's countryside
Save it with flowers

Plantlife

Our vanishing flora

how wild flowers are disappearing across Britain

Present at the time of the Silver Jubilee but gone by the time of the Diamond Jubilee...

Mountain pansy
Monmouthshire

Bell heather
Middlesex

Fragrant agrimony
Easter Ross

Green-flowered helleborine
Cheshire

Shepherd's needle
Durham

Corn mint
Banaffshire

Deptford pink
Huntingdonshire

References

Boon, C.R. & Outen, A. R. (2011) *Flora of Bedfordshire.* Bedfordshire Natural History Society.

Braithwaite, M.E. (2010) Berwickshire's disappearing scarce plants. *Watsonia,* 28 (2), 129-140.

Chater, A. O. (2010) *Flora of Cardiganshire.* Privately published.

Ellis, N. & McGowan, G. (2006) Climate change. In: The Nature of the Cairngorms. *Diversity in a changing landscape.* Scottish Natural Heritage, 353-366.

Falk, S.J. (2009) *Warwickshire's Wild Flowers.* Brewin Books, Studley.

Hawksford, J.E. & Hopkins, I.J. (2011) *The Flora of Staffordshire.* Staffordshire Wildlife Trust.

JNCC (2011) Species Designations. Jncc.gov.uk/page-1752

McCollin, D., Moore, L., & Sparkes, T. (2000) The Flora of a cultural landscape: environmental determinants of change revealed using archival sources. *Biological Conservation,* 92, 249-263.

Oswald, P.H. & Preston, C.D. (2011) *John Ray's Cambridge Catalogue* (1660). Ray Society.

Plantlife (2012) *Lost lichens and missing mosses.* www.plantlife.org.uk

Plantlife (2009) *Ghost Orchid Decleration* www.plantlife.org.uk

Preston, C.D. (2000). Engulfed by suburbia or destroyed by the plough: the ecology of extinction in Middlesex and Cambridgeshire. *Watsonia,* 23, 59-81.

Rich, T.C.G. & Pryor, K.V. (2003) *Galeopsis segetum* Neck (Lamiaceae) Downy Hemp-nettle: native or naturalised in Britain? *Watsonia,* 24(3), 401-411.

Stace, C. & Ellis, B. (2004) Areas and species richness of British vice-counties. *BSBI News,* 97, 15-19.

Stewart, N.F. & Church, J.M. (1992) *Red Data Books of Britain & Ireland: Stoneworts.* JNCC.

Walker, K.J. (2007) The last thirty-five years: recent changes in the flora of the British Isles. *Watsonia,* 26(3), 291-302.

Walker, K.J. (2003) One species lost every year? An evaluation of plant extinctions in selected British vice-counties since 1900. *Watsonia,* 24, 359-374. Welch, D. (1996) Kincardineshire (VC 91) records in *Scarce Plants in Britain. BSBI News,* 72, 20-21.

Woods, Ray (1993) *Flora of Radnorshire.* National Museum of Wales, Cardiff.

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Pat Batty

Alpine saxifrage
Caithness

Meadow saffron
Northamptonshire

Sea pea
Caernarfonshire

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Glossary

A **native** plant is one that has arrived naturally to an area without deliberate human intervention.

An **archaeophyte** is a plant that was introduced before 1500AD and has persisted naturally since.

Vascular plants have tissues that transport water and nutrients through the plant and include flowering plants, conifers and ferns and their relatives.

Bryophyte is the collective term for mosses, hornworts and liverworts.

A **hybrid** results from a cross between two different species. Some hybrids are fertile and able to reproduce, whilst others are sterile.

Calcareous grasslands occur over areas of chalk and limestone and are characterised by lime-loving plants or 'calcicoles' such as salad burnet, fairy flax and glaucous sedge.

Lichens are a special combination of a fungus and an alga growing together to form a new organism.

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CLARENCE HOUSE

In this Diamond Jubilee year there is much to celebrate and much for which we can be thankful. Over these past sixty years our national well-being has grown and, if the Olympic and Paralympic Games of the Summer of 2012 were a measure of our national confidence, then this too is flourishing. However, I am afraid to say, Nature in this country is far from flourishing. If we were to take our children and grandchildren for a walk into the countryside of 1952 it would bring home to them the amount of natural beauty that has been lost in our lifetimes.

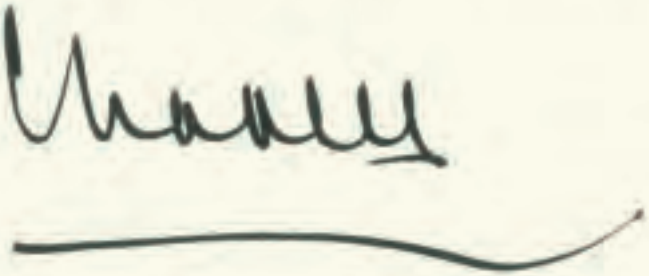
I am always delighted and inspired when the wild flower meadow in my own garden at Highgrove comes into bloom each year with so much of Nature's palette on display – one of the true highlights of the garden, which seems to be appreciated by many of the visitors. But this has only been possible due to a process of restoration of lost habitat over the past thirty years. However, I note, with dismay, this Plantlife report's statistics for Gloucestershire which state that, on average, every two years one flower species is being lost from the very county in which Highgrove lies. This shocking statistic is repeated right across the country and, if we do nothing about it, we will indeed lose a vital part of our natural heritage.

When I wrote the foreword to Plantlife's 'The Ghost Orchid Declaration' I did so in anticipation of the imminent loss of that species from these islands. The subsequent sighting of a single, solitary plant in Herefordshire was heartening to hear of but, overall, the extent of the threat to our native flora has not receded, as this new report reveals all too well. I daresay many may feel that in the great scheme of things the loss of such wild flowers is part of the inevitable price to be paid for the march of "progress". The trouble, however, is that this very progress has completely disconnected us from the natural world, so we no long appreciate that we are, in fact, an integral part of Nature; we are Nature. The more rapid we diminish her, the more we are diminished ourselves through the loss of that vital biodiversity on which, did we but know it, so many facets of our life, and our health, depends.

The wild flowers of our hedgerows and road verges, our commons, greens and open spaces, even our urban waste places, are far more than visually appealing ephemera. They are the very evidence of the strength of our own relationship with Nature; the vital 'grass roots' of our natural heritage that we cannot afford to lose. I hope this 'Jubilee Report' not only serves as an alarm call of the utmost stridency, but also fires the starting pistol for all of us to take whatever action we can as individuals and do our best to win the race against time to save our precious wild flowers. My own experience at Highgrove has shown that it is possible to recreate lost habitat with the

right management process over a continuous and prolonged period, using hay seed from existing, rare meadows. During this Jubilee year I notice there have been many Jubilee woods planted all around the country, but I have not noticed many, if any, Jubilee wild flower meadows. It is not too late to do so; next year sees the sixtieth anniversary of The Queen's Coronation. What better excuse for a concerted effort to begin the creation of at least one meadow in each county.

I hope, too, that my own wild flower meadow at Highgrove may help to inspire others, together with a new meadow I am developing there to showcase the remarkable grassland flora of Transylvania in Romania. My visits to that currently unspoiled region, with its gorgeous tapestry of wild flowers on a scale not seen here for a century, have always filled me with joy. We should all be striving to give future generations the chance to enjoy similar spectacles of native wild flowers in our own country.



Executive summary

Britain's wild flowers are in trouble. Ten species have become extinct in the 60-year reign of HM The Queen but even that stark loss hides the scale of the problem. In this report we reveal the rate of loss of flowers from over 50 counties across England, Scotland and Wales, covering more than half of the British land area.

Wild native flowers are being lost at a rate of up to nearly one species per year per county, and the rate of loss is accelerating with no sign of slowing. Our figures probably understate the seriousness of the situation but they paint a disturbing picture – a picture with the colour draining from it.

In this report we have not agonised over the reasons for the continued losses of wild plants in Britain – and that is deliberate. The reasons for loss are well known and include increased development, extensive use of herbicides, lack of appropriate woodland management, eutrophication of waterways, nitrogen deposition from the atmosphere, overgrazing and undergrazing and a host of other factors.

Many of the losers are flowers we all love and would like to see more often, such as campions, clovers and vetches, violets and speedwells, orchids and bright cornfield flowers. The net result is that the countryside of the future will be much less colourful. If unchecked, this scale of local loss and extinction will add significantly to the national total of extinct plants and be a damning indictment of any claim that we have in Britain to be practising sustainable development.

Burnt orchid is now extinct in 27 vice counties

Introduction

In this Diamond Jubilee year there is much to celebrate. Through the reign of HM The Queen the well-being, comfort, safety and wealth of the average person in Britain has risen steadily and considerably.

Few of us would wish to go back to the social and economic conditions of the 1950s, but if we did we would find a country, and a countryside, much, much richer in flowers, mosses, ferns and lichens.

To walk in those fields, woods and moors of 1952 would be an eye-opener for today's young Britons – it would bring home to them the scale of natural beauty that has been lost through the lifetimes of their parents and grandparents.

Pleasure in wild flowers transcends an interest in botany

People who know nothing about plants will nonetheless prefer a field full of buttercups and lady's smock to a dull green expanse; or a woodland of primroses and violets to one of coarse grass and bramble thickets; or the smell of honeysuckle and marjoram on a hot August day to nothing at all... Like bird song and butterflies it is something that unites us.

Here we present, first on a county basis and then drawing some national conclusions, an illustration of the declining status of Britain's flora. Our data reach back beyond the first Earth Summit a mere 20 years ago, and take us right through the reign of HM The Queen; in fact we can look back to the beginning of the 20th century so this is a long view – one which it would be difficult to produce for other groups of organisms such as insects, fish or birds.

In the years since the Earth Summit in Rio in 1992 our flora has been consistently diminished and the rate of that loss is not slowing. Sustainable development has always been a difficult idea to define and it is perhaps easier to see where it doesn't apply. Plantlife believes that a country that keeps losing plants from the lives of its people is not on a sustainable development path.

We should pay attention to the fate of our plants not only because they are beautiful, fascinating and brighten our lives but also because their fate is a measure of our stewardship of the planet and their destiny is entwined with our own.

County losses – the league table

Our league table of loss was created using county floras and rare plant registers, recent reports and experts' personal knowledge and shows that we are losing species at an alarming rate all over Britain.

As we did the research, the same names kept recurring as lost species – **field gentian, burnt orchid, royal fern, corn cleavers and small white orchid** – all disappearing from counties across Britain. Water plants, especially submerged ones like pondweeds; annuals of field edges and infertile sandy grassland, such as **shepherd's cress,** species of bogs, fens and other wet, open habitats, like **sundews, butterworts and grass of Parnassus;** species of marginal habitats such as wood edges like **crested cow-wheat**, and plants of heaths and moors, like **clubmosses** and **petty whin**.

Our analysis shows which counties have experienced the greatest reduction in plant diversity and which have escaped relatively lightly. Data does not exist for all counties, but the available data does establish the scale and extent of what is happening across Britain.

We are witnessing a gradient of decline in which widespread species become scarce and scarce ones become rare, while some rare ones eventually tip over the brink into the abyss of extinction.

In 1660 John Ray's Cambridge Catalogue started one of the great traditions of British natural history; the county flora. At its most basic, a flora is a catalogue of plants and the places in which they grow in a county. But most offer a great deal more than that. Modern floras offer encyclopaedic accounts of the county's natural habitats, weather and rocks, protected sites and botanical history. These floras are, and always have been, independent publications planned and written by local enthusiasts and form an unrivalled source of data to travel back in time and to assess long term trends in plant distribution.

(Vice) County	Extinction rate: flowers per year
Banffshire	**0.90**
Middlesex	**0.84**
Northamptonshire	**0.82**
Berwickshire	**0.79**
Sussex	**0.78**
Cambridgeshire	**0.73**
Denbighshire	**0.69**
Leicestershire	**0.68**
Bedfordshire	**0.65**
Bristol region	**0.64**
Durham	**0.63**
Essex	**0.61**
Buckinghamshire	**0.59**
Suffolk	**0.56**
Huntingdonshire	**0.54**
Gloucestershire	**0.52**
South Lancashire	**0.50**
Lincolnshire	0.45
Staffordshire	0.44
Hertfordshire	0.43
North Northumberland	0.42
Radnor	0.41
Monmouthshire	0.41
Oxfordshire	0.40
Westmorland	0.38
Cumberland	0.37
Norfolk	0.37
Cornwall	0.36
Warwickshire	0.35
Kent	0.34
Surrey	0.34
Outer Hebrides	0.34
North Aberdeenshire	0.33
Dorset	0.32
Derbyshire	0.31
Anglesey	0.31
Berkshire	0.31
Angus	0.31
Cheshire	0.30
South Northumberland	0.30
Montgomeryshire	0.27
Flintshire	0.26
Isle of Bute	0.25
Hampshire	0.25
Caenarfonshire	0.24
Shropshire	0.19
Cardiganshire	0.18
Caithness	0.18
Easter Ross	0.17
Assynt	0.16
Carmarthenshire	0.14
Wiltshire	0.08

And what does the table tell us?

- **The loss rates vary from 0.90 or nearly one species per year to 0.08 or under a species per decade.**
- **There are 16 counties where a plant species is lost every 1-2 years. These figures are averages across most of the 20th century. The evidence from more detailed decade-by-decade assessments of individual counties suggests that the loss rate today is higher, sometimes much higher, than in the past.**
- **Small counties are likely to have lost proportionately more species than larger ones.**
- **It appears that lowland counties lose more species than upland ones.**
- **Densely populated counties lose more species than predominately rural ones.**
- **It is not surprising to find the greatest loss rates among counties with a high proportion of arable land or suburbs. Cambridgeshire has lost 120 species out of a native flora of 897 species, that is, 13%. Middlesex has lost 146 species out of 816, that is, 18%, in its transformation from a largely rural to an almost completely suburban county. It seems that intensive agriculture is almost as damaging to native plants as bricks and mortar.**
- **Counties with a high diversity of habitat have tended to retain a greater proportion of their flora than predominantly agricultural inland counties.**

A closer look at the counties

British counties hold, on average, about 950 native species of flowers. They range from South Hampshire, the richest, with 1,265 species, to Shetland, the poorest, with 473 species.

We have selected nine counties across England, Scotland and Wales to illustrate the loss of our wild flowers and the factors behind them.

Berwickshire

The former county of Berwickshire lies in the Scottish Borders and is predominately hilly with the best farmland in the large catchment of the Tweed. Among the characteristic habitats are species-rich grassland, especially along the coast, river habitats, bogs, wet grassland and heather moors. The county has a botanical heraldic badge – a bull chained to a wych elm. It is in fourth place on our league table.

Berwickshire has been well-recorded, and we can say something about the status of its scarcer, and, in many ways, most characteristic plants (characteristic in that they are the species that make Berwick distinct from its neighbours). And it is unsettling.

The county recorder revisited 162 populations of "locally rare and scarce species" recorded between 1987 and 1995 and found that 45 are no longer present. This represents a loss rate in this group of 16% per decade. The drivers of change are various but similar to other parts of Britain: short, species-rich plant communities replaced by taller vegetation dominated by grasses and rushes; gradual attrition of wild places; muirburn of heather, which seems to have wiped out petty whin.

A wild flower is going locally extinct every three years in North Aberdeenshire

North Aberdeenshire

North Aberdeenshire occupies the extreme north-east of Scotland comprising the old Scottish earldoms of Gordon and Buchan. The only two large towns, Fraserburgh and Peterhead, are on the coast and inland it forms an undulating plain with hills and small rivers. Much of the land is intensively farmed, especially since the introduction of autumn-sown barley in the 1970s. Most of the bogs which formerly occupied the land have been drained. Many too were stripped of their overlying peat and reclaimed as farmland or planted forest. The county is botanically impoverished with only 833 species and hybrids recorded between 1950 and 1992.

On our cautious assessment, North Aberdeenshire has lost, on average, a species every three years. However, the vice-county recorder suggests that 42 species have been lost over 92 years making a higher loss rate of 0.46 or 0.5 in round figures i.e. one species lost every two years.

North Aberdeenshire has lost a particularly high proportion (24%) of scarce plants. Others are just hanging on. Great sundew, a signature species of wet bogs, was still plentiful in a few 'mosses' in the early twentieth century but the species seemed to have died out in our own time until a tiny and precarious colony was rediscovered recently.

What its near-loss suggests is that all the peat bogs where it grew in North Aberdeenshire are now degraded.

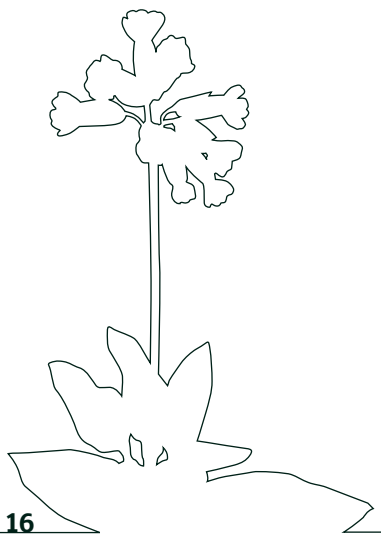
Just one colony of great sundew remains in North Aberdeenshire.

Warwickshire

"I know a bank where the wild thyme blows". It is reasonable to suppose that Shakespeare had come across such a place in his native Warwickshire, and indeed flowery banks breathing of thyme, honeysuckle and musk roses were no doubt commonplace in Elizabethan England. But today wild thyme is scarce in Warwickshire and confined to a few patches in calcareous grassland and quarries. Of the other flowers that grew on the fairies' bank, 'eglantine' (sweet briar) and oxlips (by which Shakespeare meant the cowslip-primrose hybrid), are also scarce, and even the "nodding violet" can be hard to find in the agricultural south of the county. Only 'woodbine' or honeysuckle and 'musk rose' (i.e. field-rose) are still quite frequent in the county. **The chance of finding all these plants on the same bank anywhere in the Midlands today is slight. In Warwickshire there is no chance at all.**

Warwickshire is in the middle of the league table with a loss rate of 0.35 species per year. A bar chart in the latest county flora indicates that extinctions between 1960 and 1970 greatly exceeded any earlier period. Hence our figure may possibly underestimate the true rate of loss. Some extant species, such as man orchid and dropwort are confined to protected sites and depend on conservation management for their survival.

On our calculations, the native flora of some other Midlands counties is at least as parlous as Warwickshire's. Leicestershire has a loss rate of 0.68, Bedfordshire 0.61 and Lincolnshire 0.45 (a lower rate perhaps because Lincolnshire is a larger county).



In Angus the cou recorder has be unable to r 75 na

Kincardine and Angus

Kincardine and Angus are old Scottish counties on the south-east fringe of the Highlands. Their lowlands are intensively farmed while the uplands have been much afforested, especially in Kincardine. Fields are often ploughed right up to the edge; lowland lochs have become more eutrophic through run-off and the coast has suffered from the spread of coarse vegetation and piecemeal development.

Both counties have experienced extensive plant losses, especially among the scarcer species. Despite assiduous searching, the county recorder of Kincardine was able to refind only 25 scarce species out of 52 recorded there, representing a loss rate of 48%.

25 archaeophytes haven't been seen in Angus since 1980. Whether or not they are really gone, both counties have clearly experienced a very adverse period for the survival of wild plants.

On our assessment the situation in Angus is similar to that of North Aberdeen with a loss average of 0.3 species per year. The pronounced loss of archaeophytes mentioned above may reflect the loss of valuable field margin habitats on farms.

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Cardiganshire

Cardiganshire has one of the most thoroughly documented modern floras, published in 2010. It is a diverse county with well-preserved sand dunes and salt marshes, raised bogs, ancient woods and wet natural grasslands known as rhos-pasture. As a county on the fringe of the Irish Sea with plenty of rugged wooded valleys and tumbling streams it has a rich bryophyte and lichen flora, while even its vascular plant diversity is above average. It is not surprising that **Cardigan is among the counties with the least botanical losses having lost only about two species of vascular plant per decade.**

Wales in general has shared in the decline in diversity of native plants. Certain counties, notably Denbighshire, are at the opposite end of the scale on our league table, while even the upland county of Radnorshire has experienced losses comparable with lowland counties like Oxfordshire and Hertfordshire.

The survival of Cardiganshire's plants is probably helped by the still extensive natural habitats in the county.

But it is possible that individual plants have a greater resilience in the far west than further east. The flora's author notes that plants considered to be indicators of ancient woodland in eastern England are much more widespread here.

Suffolk

Suffolk is one of the best-recorded counties in Britain. It has two recent, full-scale county floras, published in 1982 and 2010 respectively, and they form an interesting contrast in tone. *Simpson's Flora of Suffolk* was the solo effort of its 80-year-old author, who had cycled his way round the county recording plants since the 1930s. The transformation of the post-war landscape he witnessed lent his flora an elegiac air.

Suffolk has changed from a county of flower meadows, fens and clean rivers to a landscape dominated by arable farms.

The author knew those lost Suffolk plants, like toothwort, ground pine and, fen violet. Perhaps we are less sorrowful about plants that disappeared before our own times.

The 2010 county flora paints a less pessimistic picture and a casual reader would be forgiven for assuming that Suffolk is still bursting with wild flowers. There are indeed more species in the Suffolk of 2010 than ever before but nearly half of the new flora of 2,173 'taxa' (species plus hybrids) are non-native species such as Canadian fleabane and snowberry. These mostly new arrivals are numerous but only 4.5% of them are among the 200 commonest plants.

In Suffolk, the transformation in the fortunes of our native flora is not so much one of complete losses but of changes in relative abundance. For example, many Suffolk parishes in living memory had a cowslip meadow. Today you would need to visit a nature reserve or perhaps a protected road bank to find cowslips in any great numbers. And along with the cowslips other flowers have disappeared, including one of the county's signature plants, sulphur clover. It helps that Suffolk has a coastline; losses in the interior have been higher than on the shore. However many Suffolk plants are only just hanging on, and often in nature reserves.

Bedfordshire

Bedfordshire is a small county that nonetheless contains most lowland natural habitats. It has chalk grassland, acid grassland and heath, ancient woods, meadows, ponds, streams and a big slow river, and even scraps of fen. It is rich in rare plants. It is more than usually well recorded with a large and recent county flora. And it also has more than its measure of environmental change including wholesale eutrophication of soils and water, agricultural intensification, quarrying, afforestation and creeping suburbs. Famous plant localities include Knocking Hoe, Barton Hills, Sandy Heath, Flitwick Moor, Mauldon meadows and King's Wood.

The county has experienced a relatively high rate of loss. Some 52 native and archaeophyte species have been lost over the past 80 years, making a yearly rate of 0.65, slightly under the rate for neighbouring Northamptonshire and Cambridgeshire but similar to Leicestershire and Essex. The losses were highest between 1970 and 1980; there are no subsequent data. Of the county's bryophytes, 32 out of 315 species or 10% are probably extinct, although some other species are increasing, probably in response to cleaner air.

What makes Bedfordshire special, however, is a series of plots all over the county whose plants were originally recorded in 1950. They were traced and re-recorded in 2003-2004 and the results are described in detail in the new county flora. And what they reveal is shocking. The acid grassland, a habitat rich in plants, has almost all gone. **80% of Bedfordshire's meadows (neutral grassland) has gone.**

What used to be short, open plant communities have become taller, shadier and dominated by competitive plants such as shrubs, nettles, thistles and tall grasses. Only some of the woodland plots are little changed. The attributed causes include chemical fertiliser, increased ploughing and the cessation of traditional management such as grazing and coppicing. Many of the county's rare plants survive only in nature reserves and other protected sites.

Wiltshire

By our reckoning, Wiltshire is the most fortunate county in Britain in botanical terms. The figures indicate that the county has lost less than one (0.8) species per decade. However the Wiltshire Flora Mapping Project of 1984-92 included an appendix of species it had failed to refind since the last flora of 1975 including several species of pondweeds and sedges, orchids such as narrow-lipped helleborine and narrow-leaved helleborine, and the yellow star-of-Bethlehem. Nonetheless we can still assert that Wiltshire is a safer place for rare plants than most other counties.

We can only speculate why that may be. The county is relatively rich in woodland and wet grassland and Salisbury plain is the largest area of calcareous grassland in NW Europe, protected under European law. Of great significance to the survival of rare plants is the small corner of the county abutting the New Forest where species of heathland and wet, acid grassland find a refuge. Road verges possibly offer another refuge, since herbicides have not been used extensively there.

Nonetheless the low apparent loss rate masks significant losses of natural habitat. A significant proportion of chalk downs and wet meadows have been ploughed. There is little good quality chalk downland left on the Marlborough Downs and of fritillary meadows still present in the 1960s, only 11 had survived by 1992. **Five fritillary meadows have been destroyed since 1992.**

Some once widespread species have much decreased, including juniper and the 'Wiltshire weed', meadow cranesbill that once turned the road verges a shimmering blue in high summer. Even in this apparently safest of counties, things are not what they were.

Northamptonshire

Northamptonshire is a landlocked county in the East Midlands which in some places resembles the Cotswolds and in others the Midlands. It has two historic, well-wooded forests, Rockingham and Salcey, and a classic lowland river, the Nene.

Though naturally rich – its geology is a mixture of Jurassic limestones, sandstones and clays – the county has lost a lot of wildlife. One estimate compared what had happened between the first county flora published in 1930 and the second published in 1995. **Northamptonshire has lost more plant species than almost any other rural county in England.**

With a loss rate of 0.82 species a year it seems that Northamptonshire is among the most botanically luckless counties.

Some of the reasons, notably an increase in nitrogen deposition and the resultant wholesale pollution of the county's wetlands, are well documented. It may be that Northamptonshire is also vulnerable because of the small extent and isolation of its natural habitats. The county's heathland is now restricted to a former firebreak between a plantation and a railway line.

The poor power of dispersal of many plants that are confined to a particular habitat dooms them in advance.

Snakeshead fritillary,
lost from Northamptonshire
and 16 other vice-counties

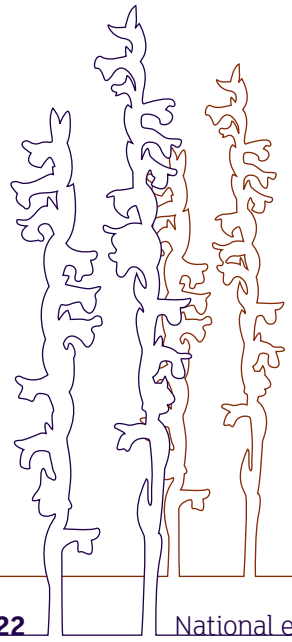
National extinction
– a closer look at the figures

Since botanical records began in the 17th century, 80 species (flowering plants, mosses, liverworts and lichens) have become extinct in Britain; on a country level the figures are even higher – England has lost 106, Wales 86 and Scotland 97.

Of the British total, 18 are wild flowers. However, more than half of these (ten species) have been lost in the reign of HM Queen Elizabeth II. These flowers, lost completely from Britain in the last 60 years are:

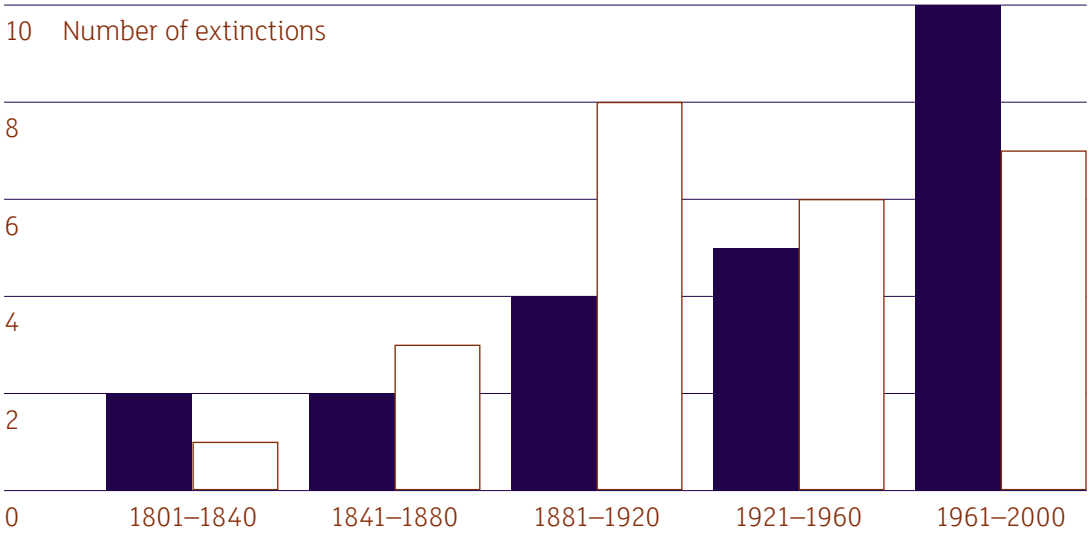
- Narrow-leaved cudweed
- Summer lady's tresses
- Small bur parsley
- Purple spurge
- Lamb's succory
- Interrupted brome
- Downy hemp-nettle
- Irish saxifrage
- Stinking hawksbeard
- York groundsel

Some of our rare orchids can now only be found sheltering behind wire cages like animals in a zoo. The point at which a species may become effectively extinct in the wild is to some extent in the eye of the beholder...



Number of native and archaeophyte species that can now be classed as 'extinct'

Country	**Total species lost**	Flowering plants	Mosses and liverworts	Lichens
Britain	**80**	26	25	29
England	**106**	20	36	50
Scotland	**97**	53	28	16
Wales	**86**	38	26	22



- **Vascular plants**
- **Bryophytes**

The number of extinct species in Britain is broadly similar for flowers, mosses, liverworts and lichens: between 20 and 30 species. However there is a proportionately greater loss among mosses and liverworts because there are fewer species of these.

The bar chart compares the dates of extinction of flowering plants and bryophytes. Data for lichens are not available.

Of a total of 1,346 wild plants in Britain, 45 are classed as Critically Endangered, 101 species as Endangered, and 307 species are listed as Vulnerable.

In other words, about a third of our plants is of conservation concern and has edged towards extinction.

Gone forever

The tragedy of downy hemp-nettle

Today when we think of cornfield flowers we think of red poppies or mayweeds. In many parts of northern England and Wales, 200 years ago, country dwellers would have been familiar with a beautiful plant that was sometimes abundant at the edge of fields of oats and barley.

This one had loose spikes of cream-and-yellow flowers and downy, nettle-like leaves. This was the downy hemp-nettle which until the 20th century was widespread across northern England and Wales, and as far south as Essex. In modern times it was confined to north Wales, notably in a cluster of small, traditionally-worked farms near Bangor.

Downy hemp-nettle was first recorded in 1773 “in the cornfields and on the earth walls about two miles from Bangor on the road to Llanberis” and was rediscovered there in the 1950s by the headmaster of a local primary school who had encouraged his class to pick wild flowers for the nature table but was flummoxed when a little girl brought in a bunch of downy hemp-nettles. They were “the prettiest flower in the cornfield”, she explained.

The hemp-nettle had thrived here after disappearing nearly everywhere else because the farms still practised an age-old system of crop rotation by which alternate patches of barley, oats or potatoes were grown (the system also favoured the rare corncrake). It all came to an end in the 1970s when the old hemp-nettle fields were sown with grass and sheep were introduced. Diversity turned into uniformity and the downy hemp-nettle was last recorded in 1975.

Summer Lady's tresses

Summer Lady's-tresses has the unenviable record of being Britain's only extinct orchid. This beautiful species, with its elegant spiralling stems of crystalline, gleaming white flowers, graced the spongy wet heaths and bogs of the New Forest, its only mainland site, growing alongside cross-leaved heath, bog myrtle, purple moor-grass and sopping sphagnum moss. Discovered in 1840, the species was recorded from five sites in the gladed woodland and heathland landscape to the south-west of Lyndhurst, though rarely in any quantity. The botanist E.D. Marquand, writing in 1901, recalled that he "once saw half an acre of bog perfectly white with these flowers", though typically populations numbered in the tens or low hundreds at best. By the turn of the 20th century, the species was in major decline: drainage and forestry certainly contributed to the species demise in at least one site, though today some sites still remain in apparently fine condition for the species.

The abundance of dried specimens in our museums and herbaria – with 236 specimens counted in a sample of just three institutions – hints perhaps at the main cause of decline, collection by botanists. Whatever the cause, within little more than a century after its discovery, the species was extinct. Persistent rumours that plants have been re-established in the Forest, without the approval and monitoring of landowners or statutory agencies, perhaps finally dash the hopes of many flower-lovers, who dream of rediscovering truly wild plants of this enigmatic orchid in some out of the way spot.

Interrupted brome

This grass was discovered in 1849 in Cambridgeshire and was only ever recorded in southern England up until its last record in 1972. As a plant of arable fields it suffered at the hands of herbicides and was driven to extinction in the wild. Seeds were kept and a reintroduction project is underway in the Chilterns. There aren't many places in the world which might seek to reintroduce a plant that famers would regard as a weed, but this grass is only found in the UK and poses no appreciable threat to food production.

The next national extinctions?

Predicting the next extinct British plant is hazardous but taking a look at some of those species that are now Critically Endangered may give us an idea of which could be next in line.

The unlucky 13

- Corn buttercup
- Fringed gentian
- Yellow early marsh orchid
- Small fleabane
- Fen wood-rush
- Corn cleavers
- Red helleborine
- Tall thrift
- Crested buckler-fern
- Triangular club-rush
- **Starfruit**
- Strapwort
- Perennial knawel

Starfruit is all but gone from Britain's shallow ponds

Conclusion

What might our flora look like in 2050, perhaps in the reign of King William V? Will today's losses be a thing of the past? Will we manage to defy the seemingly inevitable and hang on to today's flora and its diversity? Will we, despite a larger population, have found ways of sustainable land use that leave space for nature to thrive? Or will the present trends assert themselves ever more strongly resulting in a countryside yet more homogeneous and consigning more and more wild plants to nature reserves?

It depends on what decisions we make now. At the moment, as Plantlife highlighted in 2009, plants and fungi come last in the struggle for limited resources. Nearly half of the 1,150 'priority species' in the UK Biodiversity Action Plan are plants or fungi but they attract a fraction of the budget.

Increasingly the fate of our wild plants depends not only on dealing with direct threats like habitat destruction or deterioration but on our ability to control indirect threats such as eutrophication and climate change. For many, the answer lies in 'gardening' the countryside and urban brown spaces, such as the pictorial meadows (which lack grass and so are not by any normal definition of the word, meadows). Blurring the boundaries between what is natural and what is not is dangerous because the public on whose support we ultimately rely might not appreciate the difference. Nature conservation is surely about conserving nature, that is, the natural and the wild.

We also need to maintain our traditional love for nature. We are inheritors of a four-hundred year-old tradition of amateur field botany second to none. But expert botanists are aging, and there are fewer in the younger generation to replace them. Paradoxically, as the nation gets greener, fewer people seem to know our wild plants. Informative choices require knowledge as well as affection.

Most importantly we must conserve plants in their place: in the spaces that nature has chosen.

And it will not be enough to know that once common primroses and bluebells and wild orchids are out there somewhere. We need them to be familiar: as neighbours and friends. Many people today have probably never knowingly seen a wild orchid.

The horror would be if they never saw a white campion or a cowslip either.


A challenge to 21st century Britain will be to conserve species and yet maintain their essential wildness

How did we create our league table?

Lists of lost plants enable us to calculate the rate of loss, as species per year. To produce figures that can be compared across counties, we employed due caution even at the risk of underestimating the scale of the problem. We have excluded the following:

- All doubtful or unconfirmed records
- All neophytes, that is, non-native plants of recent origin
- Any species whose presence might have been ephemeral, casual or of recent provenance – for example, plants introduced as plantings or in 'wild' seed mixtures
- Micro-species of dandelions, hawkweeds and brambles
- All hybrids and taxa that are less than full species (sub-species, forms, varieties etc)
- All species without a date for the last record
- All species last recorded after 1986

How do we know when a plant goes missing from a county?

Many, though not all, county floras include a list of lost species together with the year of their last record. In general the authors of floras are cautious about assigning a species to the "lost list". Very recent losses are unlikely to be charted since most county floras are based on a recording period of between ten and 30 years. Hence a county flora published in 2012 may include records from as long ago as the 1980s, and list as extinct only those species not recorded during that whole period. Some species may lurk unseen for many years, so it is possible that they may reappear one day – but this gets more unlikely as time goes on.