Plantlife

# Forestry Recommissioned:

## Bringing England's woodlands back to life

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# Britain's woodlands are exceptional

**Our unique geographic position in the face of prevailing Atlantic weather, together with our varied geology and landscapes, has given rise to an outstanding diversity of wooded habitats for our relatively small land area. Certain English woodlands are of global importance.**

## And what is it that makes them so important? The plants of course...

# Executive summary

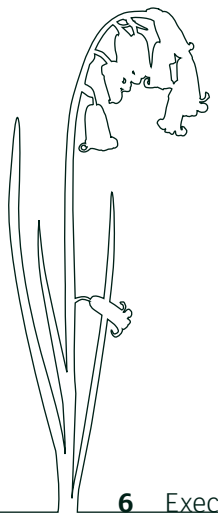
## There is much debate about the future of England's woodland. A great deal of it to date has been about who should own our woods and forests and how extensive they should be.

Who owns our woods shouldn't matter; it is what we do with them that counts. This report shifts the focus to managing our woodlands so that they deliver for us and for our wildlife. Plantlife's vision is for a woodland estate where the economic incentives exist for private woodland owners to manage their woods more actively, and where those woodlands in public ownership are managed to the highest standard to deliver the public benefits of beautiful landscapes rich in wildlife.

England today has more woodland than 20 years ago. It is not a rare and restricted habitat but a widespread and familiar part of the landscape. We have 5 times more ancient woodland than limestone grassland, 27 times more woodland than lowland meadow, and a staggering 229 times more ancient woodland than upland hay meadow.[1] Yet, characteristic woodland birds and butterflies continue to decline and woodland plants are vanishing at a greater rate than meadow species. It would seem that the Government's ambition to create a further 10,000 hectares of new woodland in England every year until 2020 is perhaps too simplistic. **More woodland is a well-intentioned aim but what we really need is better woodland.**

So why are England's woodlands losing their life and vitality? They aren't being bulldozed, concreted over or burned down – they are still standing and you can still walk through them. **The simple answer is that too many of our woods are neglected, mismanaged or under-managed.** This is the major threat to their plant life and to the other wildlife that depends upon a rich woodland flora. Overgrazing by a soaring deer population and nutrient enrichment from atmospheric pollution compound the problem.

If our native woodland – much of it of international importance – is to be protected and enjoyed by future generations, then private and public woodland owners need to take a more informed and more active approach to woodland management. **It matters little who owns dull woodlands devoid of natural beauty and nor do we need more of them.** In the International Year of Forests, this report sets out Plantlife's recommendations to put the life back into England's woodlands.




We need to put less emphasis on the quantity of woodland but focus instead on the quality

# If you go down to the woods today...

Enter most English woodlands and you are likely to find them

## dark overgrown and quiet

A lack of active management means that sunlight can often no longer reach the woodland floor. Rarely grazed by livestock, woodlands are often overgrown with brambles and suffering from high levels of nutrient pollution, which encourage plants like nettles instead of our specialist woodland flora.

## Woodland like this has lost its wildlife

**Lesser redpoll suffered a 78% decline between 1966 and 2000[2]**

# What's gone wrong with our woodlands?

## 1. Lack of management

There is a widely held belief that in primaeval times, closed high forest covered the lowlands of Britain. This has resulted in our tendency to treat woodlands and grasslands as separate and distinct entities, including in the way that they are managed. However, evidence suggests that Britain's lowland forest landscapes looked, at least in part, like the mosaic of habitats seen in the New Forest today[3]. Many grassland types originally occurred as part of the wider 'wildwood' mosaic, becoming more expansive and open with the increasing impacts of both woodland management and agriculture. This perhaps explains why the majority of our woodland flora, both common and rare, responds well to good light and low scrub levels.

Throughout history, England's woodlands have been used for everything from grazing livestock to harvesting timber, from hunting animals to gathering fruits and fungi. As recently as a hundred years ago, they were still being regularly coppiced for hurdles, pit props, poles and charcoal; bracken, leaf litter and branches were collected for animal bedding and fodder, and the tannins found in oak bark were used in the tannery industry.

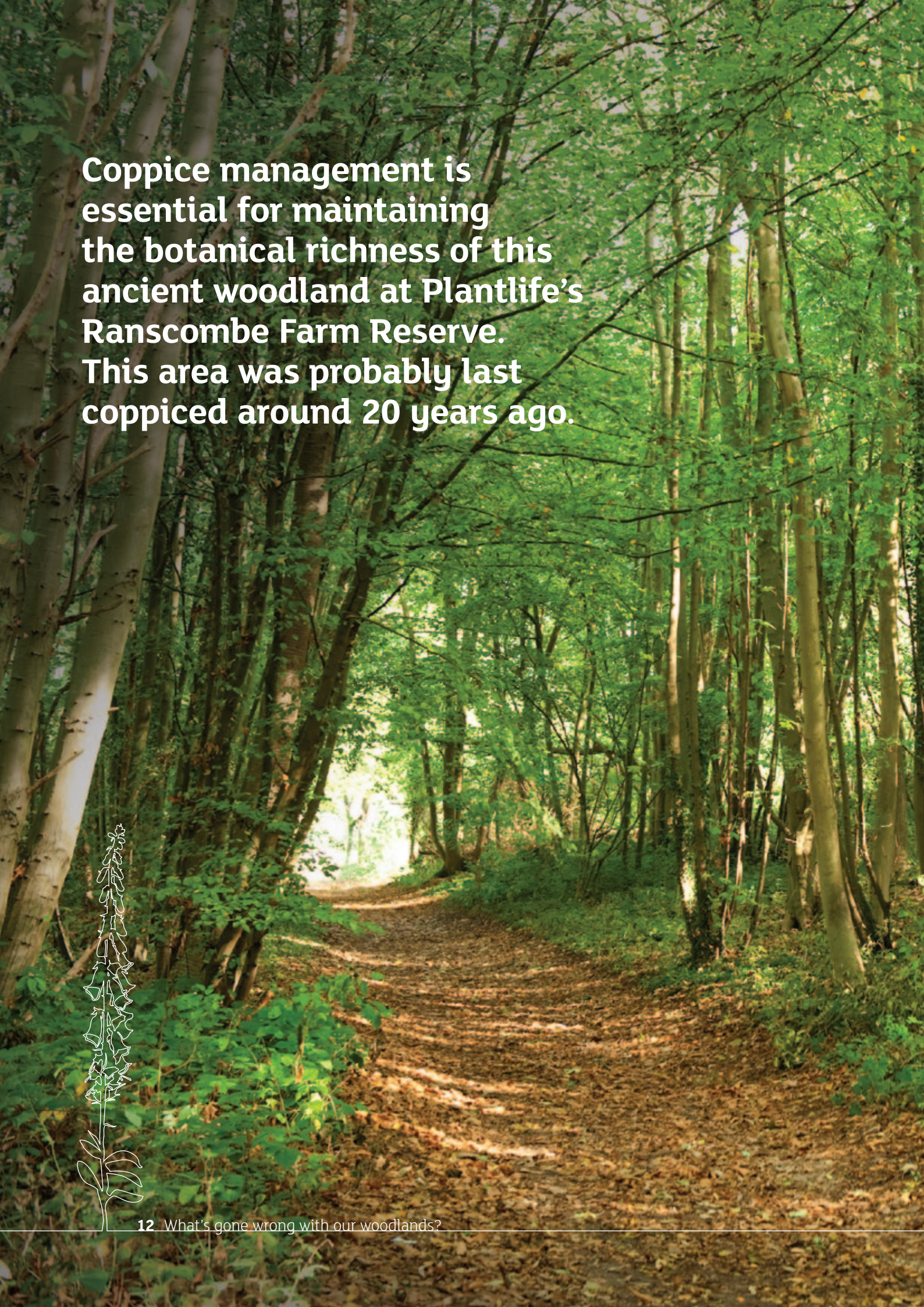
All this human activity kept woodlands diverse – there were glades, patches of grassland, recently cut areas and some high trees. Far from harming woodland wildlife, this form of active management kept our woodlands rich and varied, providing the opportunities for many different plants and animals to flourish.

Today, traditional management of broadleaved woodlands has declined dramatically. In addition, much of England's lowland woodland lies isolated within a landscape of arable fields or is fenced off from adjacent grasslands, so blocking access for livestock. Financial support from various woodland grant schemes has hastened this process by encouraging the fencing off of woodland and infilling gaps in the woodland canopy with new tree planting.

Under these conditions, often unmanaged and ungrazed, many of our woodlands have developed into high forest, devoid of structural complexity, habitat diversity and, crucially, light.

**In 1947, 49% of broadleaved woodland was classed either as coppice or scrub and just 51% as high forest. By 2002, high forest represented a staggering 97% of the broadleaved resource[4].**

Most woodland plants are not shade tolerant and prefer lighter conditions. This not only applies to woodland flowers but also to lichens, mosses and liverworts.



**Coppice management is essential for maintaining the botanical richness of this ancient woodland at Plantlife's Ranscombe Farm Reserve. This area was probably last coppiced around 20 years ago.**

# The solutions

## Coppicing and pollarding

The traditional practices of coppicing and pollarding open up the woodland canopy, so letting in light and creating conditions suitable for the majority of woodland plants. Actively managed coppice in the lowlands of south and eastern Britain is especially valued for its displays of spring flowers such as wood anemone, primrose, early purple orchid and wood violet. Rarer species associated with the early regrowth of coppice, such as lady orchid and green hound's-tongue, have declined as a result of the reduction in coppicing, although some flowers, such as oxlip and Suffolk lungwort, have been able to survive in the more shaded conditions, but with reduced populations.

Half of Plantlife's flagship Ranscombe Farm Reserve in Kent is woodland. This includes ancient, semi-natural woodland but also areas of replanted woodland (including some 90 hectares of almost pure sweet chestnut) and more recent woodland. The more recent woodland includes areas where, during the 19th century, trees were planted on, or colonised, previously open habitats.

**The botanical interest of these woods is in the gaps, edges and more open stands of trees.** Plants such as common gromwell, columbine and wild liquorice benefit from the partial shade and periodic disturbance along the margins of woodland rides. Where woodland is coppiced, lady orchid and early-purple orchid occur and appear to be spreading. Open stands of trees and scrub support good populations of white helleborine, fly orchid, and even man orchid. Woodland rides and open space also occasionally support some of the open ground plants for which the reserve is most important, such as the nationally scarce white mullein and the extremely rare rough mallow.

Because of this rich plant interest, woodland management at Ranscombe is focused on maintaining and restoring coppice management across a substantial area, widening and maintaining woodland rides and glades, and recreating lost areas of open habitat. In time, this will create a more dynamic system, allowing the increase and spread of rare and important woodland species and allowing plants of open grassland, field margin and scrub to move through and exploit the woodland landscape.

## A new study of wild daffodils for the Gloucestershire Wildlife Trust[5] found that the considerable decline in these celebrated flowers is due to:

- **the decline in sustainable woodland management leading to heavily-shaded coppices. Where coppicing or thinning was reintroduced wild daffodil populations recovered.**
- **a decline in grazing, allowing brambles especially to shade out daffodils and increase competition at root-level. Some of the densest wild daffodil populations were encountered in woodland where the understory was cleared annually.**

## Grazing stock in woodlands

Managed grazing encourages plant species diversity, maintains habitat diversity and allows natural regeneration. Controlled grazing by domestic livestock needs to be reinstated into many woodlands. Domestic stock can be moved in and out of woodlands easily and in response to the particular management needs of individual woods.

Chappett's Copse is home to the largest population of narrow-leaved helleborine in the UK, with over 4,000 of the white orchids recorded for the last two years. Hampshire & Isle of Wight Wildlife Trust has achieved this spectacular result by doing two things: opening the canopy to allow in more light and implementing a cutting regime to reduce competitive species such as bramble and dog's mercury. This cutting, which mimics intermittent grazing, has also encouraged other flowers such as sanicle and woodruff, which, in turn, attract orchid-pollinating bees.

An increasing number of grazing projects are being established across England, including in the Blackdown Hills, West Weald, Sherwood Forest and Savernake Forest. At Savernake, a Site of Special Scientific Interest (SSSI) with ancient wood pasture relics and rare lichens and fungi, a 30-hectare enclosure within the woodland has been grazed from April to September. Part of a pilot scheme on woodland grazing, the results of this five-year project should help inform future grazing initiatives.

## Woodfuel

Woodfuel could provide a significant and economic solution to the management of our neglected woodlands in the future. It represents a low carbon source of energy, would reduce the UK's negative impacts on forests overseas and could potentially increase the commercial value of under-utilised woodlands. The Forestry Commission England's *Woodfuel Implementation Plan 2011–2014*[6] will help realise the aims of the National Renewable Energy Plan to bring an additional two million green tonnes into the growing English woodfuel market each year by 2020, theoretically providing energy for 250,000 homes, and bringing approximately half of England's neglected woodlands into active management. If undertaken sustainably, with safeguards to regulate both the rate of clearance, and to protect old wood features (such as epiphytic mosses and lichens),

**the woodfuel market could represent the single most important economic activity to reinvigorate our woodland wildlife.**

Announced this year, the Renewable Heat Incentive (RHI)[7] is a green economy initiative likely to significantly increase demand for woodfuel and revolutionise the renewable heat sector. The potential for the RHI to stimulate active management in small, privately owned woodlands is an exciting opportunity for a return for working woodlands and wildlife.

## Narrow-leaved helleborine

**The Chappett's Copse conservation programme vividly demonstrates that correct management – in this case opening up of glades to allow light in and the mimicking of grazing – can result in thriving populations of rare plants, giving hope for other sites where numbers are down to just a handful of plants.**

**In ten years of Plantlife surveys, nitrogen-loving nettles are the most commonly recorded species**[8]

# 2. Nutrient pollution

## 93% to 98% of Britain's woodland area is growing under excessive nitrogen levels[9]

**Like the wild flowers of open habitats, the greatest diversity of woodland flora is found in woodland with low nutrient levels.** There is unequivocal evidence from a number of studies that nitrogen enrichment encourages a narrower suite of species to flourish in woodlands at the expense of many characteristic woodland species.[10] In areas of high nutrient levels, species such as nettle, bramble and wild garlic out-compete other species, so contributing to the homogenisation of our woodlands.

Atmospheric nitrogen deposition, mainly from nitrogen oxides and ammonia emissions, alters acidity and nutrient balances and impacts on both ground and epiphytic flora within woodlands. Unfortunately, as woodlands and forests 'scavenge' air pollutants effectively, the effects of nitrogen deposition in woodlands are generally greater than those for other habitat types.[11]

Once these nutrients enter the woodland ecosystem, they become 'locked-in' to the cycle of growth and decay. In addition, as traditional management to remove the natural build up of organic matter has ceased, this has created a cycle in which the build-up of nutrients in the soil results in faster growth of vigorous plants and hence the production of ever greater amounts of organic matter. Many rarer woodland plants favour little or no leaf litter build-up. Just as nutrient levels have taken years to increase, so they will take time to reduce.

Oliver Rackham provides evidence for the historic removal of nutrients from woodlands as a result of management techniques. In eastern England, the length of time between coppice harvests increased from an average of six years in the 13th century to 14 or 15 years by the 19th.[12] It is likely that part of the reason for this was falling soil fertility, meaning that it took longer for the coppice branches to grow to a usable size. A recent study supports this notion, concluding that decreasing the rotation length of chestnut coppice enhances the depletion of soil nutrients.[13]

By restoring traditional woodland management practices, we can start to reduce the nutrient loads in our woodlands. However, it is only through repeated coppice cycles over a period of years that serious nutrient depletion will begin to take effect. Our woodlands have been managed in these ways for hundreds of years and, if we are serious in our desire to have a diverse woodland flora, then similar long-term management objectives should be set for England's woodlands today.

Measures which reduce the run-off of nutrients from farmland and the release of nitrates and ammonia into the atmosphere from transport emissions, agricultural fertiliser use and slurry would help reduce the pressure on woodlands and other habitats. However, increased removal of woodland biomass as a result of increased management, such as coppicing, will reduce nutrient loads appreciably.

# 3. Deer

**Across lowland England, ancient woodland vegetation structure and floristic diversity is being severely compromised by excessive numbers of deer. This has contributed to a decline in national populations of some woodland birds and many woodland butterflies. In upland woodlands (oak, ash and particularly birch), overgrazing by deer limits regeneration.**

## Deer have three main impacts:[14]

### Destruction of vegetation structure

Deer browsing is responsible for the 'hollowing' out of the sub-canopy layer of woodland vegetation, particularly the ground flora and shrub understory, so removing the multi-layered structure of woodlands. The loss of this natural structure has been implicated in the decline in woodland birds that rely on a dense shrub and ground layer for shelter and breeding.[16] For woodland butterfly species, the reduction in abundance and height of key food plants – such as violet, primrose and ladies'-smock – are having a disproportionate impact on populations.

### Loss of characteristic woodland plants

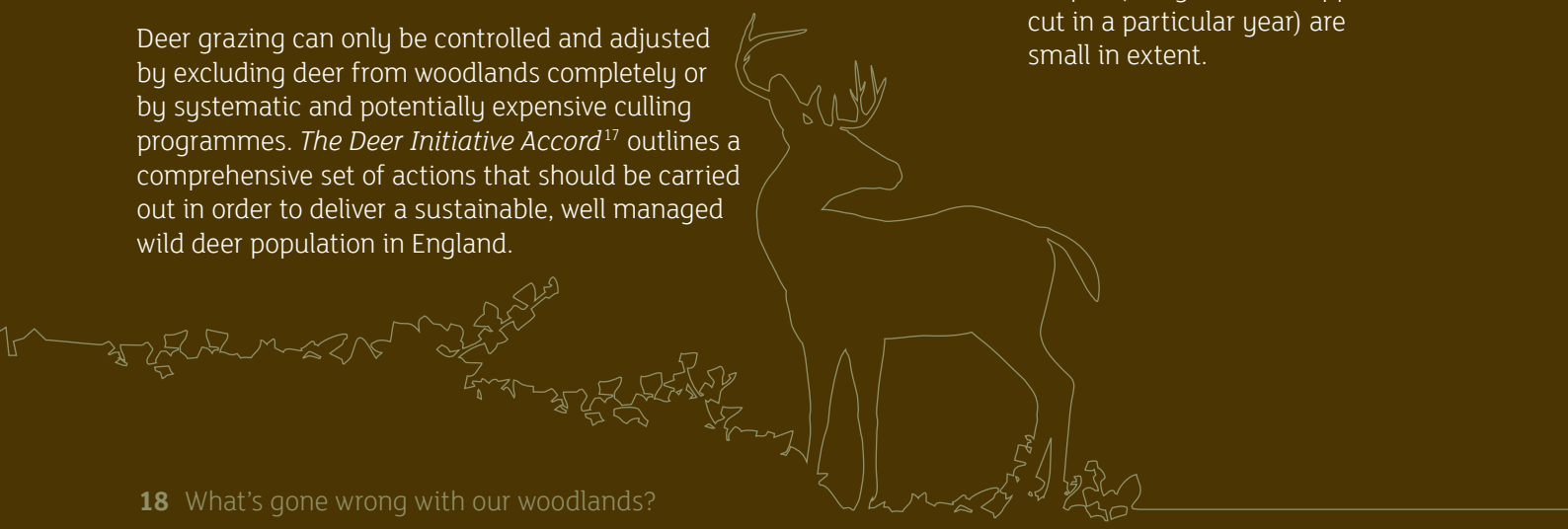
The greatest concern focuses on the impacts of unprecedented levels of deer browsing on the ground flora and low shrub layer. Bluebell, primrose, common spotted orchid, early purple orchid and wood anemone are amongst the many woodland flowers browsed by deer, along with national rarities such as oxlip, a particular favourite of fallow deer.[15]

### Prevention of woodland regeneration

In many lowland broadleaved and mixed woodlands, saplings fail to grow beyond 2 metres, the height to which deer can browse. Regeneration of coppice stools can be particularly poor in areas of heavy roe deer densities, particularly since many modern coupes (every block of coppice cut in a particular year) are small in extent.

# The solutions

Deer grazing can only be controlled and adjusted by excluding deer from woodlands completely or by systematic and potentially expensive culling programmes. *The Deer Initiative Accord*[17] outlines a comprehensive set of actions that should be carried out in order to deliver a sustainable, well managed wild deer population in England.



**England's deer populations – particularly of roe, fallow and muntjac – are reaching epidemic proportions and their grazing in woodland is only sporadically controlled**

# The declining value of England's woodlands

Essentially the plant conservation interest and importance of England's woodlands can be seen as a pyramid with the few very best ancient sites at the top, a strong cohort of ancient woodlands in the middle and then the majority of wooded areas being currently of much lower importance for wildlife but with huge potential.

Today, the wooded area of England is estimated to be 1.1 million hectares, or just under 10% of England's surface area. Only half of this is ancient or recent semi-natural broadleaved woodland[18] with our characteristic oaks and ash, bluebells, wood anemones, violets and primroses. Much of England's woodland plant resource lies in these woodlands - yet only around a quarter of them are designated as Sites of Special Scientific Interest and only half of these are in favourable condition.[19]

## Britain has one of the highest populations of veteran trees in Europe.[20]

The remainder of our woodland is recent broad-leaved and conifer plantations which are of much lower conservation importance. It is to *this* category of woodland that further planting of trees will add. Planting new woodlands will not, for centuries, replicate the conservation importance of our ancient forests with their veteran trees.

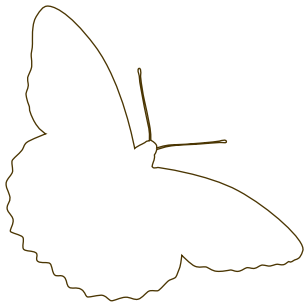
### Important Plant Areas (IPAs)

**The Important Plant Areas project, co-ordinated by Plantlife, identifies internationally important areas for wild plants across the globe.**

In 2007, Plantlife published a list of the UK's Important Plant Areas.[21] Of the 150 IPAs identified to date, one third (52) are recognised, at least in part, for their woodland features, highlighting the importance of woodlands for plant conservation. Their protection and management contributes towards the UK's international commitments from Nagoya – IPAs are an integral part of the Global Strategy for Plant Conservation, which is an integral part of the Convention on Biological Diversity with objectives to achieve by 2020.

**The pearl-bordered fritillary, which likes open woodland such as coppice, has declined by 80% since 1985.[22]**

# 1 in 6 woodland flowers is threatened with extinction[23]



**Three recent studies all tell a tale of declining variety in woodland plants – on a walk in the woods you will see fewer plant species now and our woods are losing their variety and differences.**

A study by English Nature, published in 2005, looked at long term ecological change in woodlands.[24] It focused on 103 woods, which had originally been surveyed in 1971. It reassessed the same plots in 2001 and found that overall species richness in the ground flora had declined markedly, with a 36% decrease per plot and a 12% decrease per wood. Woodland specialists such as yellow archangel, wood sorrel, primrose and sanicle had decreased in frequency, with **56 of the 72 woodland specialists becoming significantly less common.** There were small increases in frequency of shade tolerant species such as beech and holly, and a general shift towards more shade-tolerant vegetation.

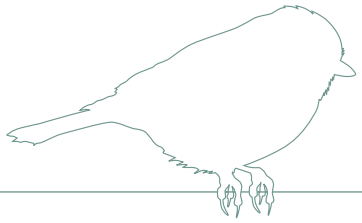
The Countryside Survey focuses on changes in the British countryside, based on repeated surveys carried out between 1978 and 2007. The results indicate that broadleaved woodland species diversity decreased by 9.3% between 1990 and 2007 indicating that **our woodlands are losing their variety of plants and becoming more homogeneous**.[25]

A more recent and local study took advantage of work undertaken in the 1930s by Professor Ronald Good, who recorded the vegetation and flora across Dorset at specific sites. By resurveying these sites Bournemouth University and the Centre for Ecology & Hydrology showed that 21st century Dorset woodlands are less distinctive than those of the early 20th century.[26] Of the 86 woodland stands resurveyed, the study highlighted the decline of 117 mainly light-loving species. Meanwhile, there was an increase in 47 species, **particularly in nutrient and shade-tolerant species, such as wild garlic, nettle and holly.**

Plants are the foundation upon which all nature depends. As our plants have declined, so has our wildlife. In particular, many woodland birds and butterflies have declined in numbers and range.[27] **This coincident decline of woodland plants, butterflies and birds indicates fundamental and important changes are happening within our woodlands that need to be addressed.**

## The UK Butterfly Monitoring Scheme shows a 56% decrease in woodland butterflies

- **Up to half the global population of bluebells is found in Britain.**[28]
- **There are almost 250 woodland specialist flowers in our woodlands.**[29]
- **Britain is amongst the richest countries for mosses and liverworts in Europe, and of significance at a world level.**[30]



# The Woodland Bird Indicator is at its lowest level since 1970

# Plantlife recommends...

**This report focuses on the need for more active woodland management as the major solution for woodland wildlife declines. Whilst there are many reasons to want to increase the extent of woodland cover, planting more woods only has a minor role to play in the recovery of wildlife compared with increased management.**

## Woodland extent: the right trees in the right places

**In the past, important wildlife populations have been damaged or destroyed by planting wildlife-rich habitats with non-native conifer crops. In Dorset, just two out of the 44 populations of heathland flora recorded in the 1930s survived the plantation afforestation of the 1990s – a loss of over 95%. Populations of chamomile, marsh clubmoss and pale heath violet all disappeared.**

**Given government's ambition to increase woodland area it is vital that the mistakes of the past are rectified and that no further damaging errors are made.**

- Woodland creation schemes should only target landscape areas that are essentially wooded in character, and seek to enlarge or link existing areas of ancient semi-natural woodland.
- Wherever possible, native woodland creation schemes should take place through natural regeneration and follow ecological guidelines, such as Plantlife's Zones of Opportunity approach, similar to the Forestry Commission Forest Habitat Networks but with a focus on plant and fungi needs.
- Grant schemes for woodland creation need effective environmental impact assessments to ensure that no wildlife-rich, open habitat is lost, such as bog, heathland or species-rich grassland.
- To encourage a mosaic of species-rich habitats, new woodland planting schemes should endeavour to keep 25% of the overall woodland area as open habitat.
- Protection for ancient woodland and other priority woodland sites, including Important Plant Areas, should be afforded through any reform of the planning system.

# Increasing and improving woodland management

**We need to get England's woods back into good heart. This will require government supporting the private sector through incentives and grants, as well as urgent action on the Public Forest Estate.**

**Government is, and should remain, a major woodland landowner and manager. The Public Forest Estate should remain in public ownership, until such a time as it can be demonstrated that adequate resources are available to the conservation or private sector to deliver its maximum conservation value. Publicly owned forests, managed by the Forestry Commission, should serve to be exemplars of wildlife management, a public good, rather than try to demonstrate excellence in timber production which can safely be left to the private sector.**

- Increase the area of certified woodland across England, aiming to achieve at least 75% by 2020.
- All publicly funded woodland management should require an assessment of botanical value and of the impact of operational objectives on plant diversity.
- Government should lead by example to fully restore all Planted Ancient Woodland Sites (PAWS) within publicly owned woodlands.
- Woodland grant schemes should provide at least 80% standard costs for key ancient semi-natural woodland areas, woodland Important Plant Areas, and other areas with woodland plants of conservation concern.
- Local Nature Partnerships and other community driven environmental planning and land management should prioritise the conservation of rare, threatened and internationally important woodland flora within their patch.
- Government and private sector should work together to learn from existing initiatives to rapidly develop and invest in woodfuel infrastructure and markets, thereby delivering the Forestry Commission England's *Woodfuel Implementation Plan 2011–2014*.
- There should be strong presumption against the felling and removal of veteran trees in the English landscape.
- Agri-environment scheme payments should be targeted to encourage appropriate levels of grazing in woodland Important Plant Areas, through trials where necessary.
- Landscape scale initiatives, such as Nature Improvement Areas, should seek to develop (where ecologically appropriate) extensively grazed mosaics of woodland, scrub and grassland/heathland.
- Research is needed to evaluate the role of active management in reducing high nutrient loadings in woodland.
- Government must work to link policy on agriculture, transport and industry to reduce the impacts of nitrogen on air pollution
- The aims of *The Deer Initiative* should be delivered, in particular the promotion of deer management and venison processing and marketing, and the establishment of adequate monitoring and surveillance arrangements for deer in England. Deer numbers need to be controlled to levels whereby woodlands are neither ungrazed nor overgrazed.

# Conclusion

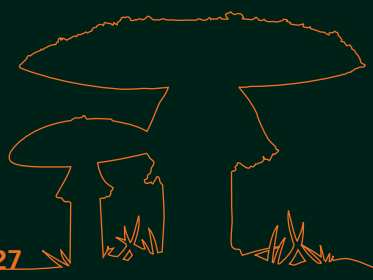
**People love trees. However, an English wood is so much more than trees. In fact, within a woodland landscape, less is often more.**

In the current debate about the role of the state in woodland ownership, and the ambition to increase woodland cover, Plantlife believes that the crucial role of management in protecting the conservation value of English woodlands is being neglected. To thrive, woodland wildlife needs open spaces with coppices, rides and glades: we need to restore these lost areas and let in sunlight and life.

If managed sustainably, woodlands offer huge benefits in terms of biodiversity, public access, recreation, landscape quality and additional ecosystem services, as well as a supply of timber and other woodland products. For this to happen **we need to embrace woodland management as a way of life** and re-establish the connections between woodlands and the landscapes within which they sit.

2010 saw a spectacular worldwide failure to halt the loss of species – as a result the UN has declared 2011–2020 the Decade of Biodiversity. We need a major shift in how society both respects and utilises the natural environment in order to meet urgent ambitions such as that set by Government in England[31] to have 90% of priority wildlife habitats in favourable condition. Species are the currency of environmental success; increases or decreases in populations allow us to track the state of ecosystems – and woodland wildlife is no exception.

**Unless woodland management is revitalised we will continue to see a net loss of woodland plant diversity and abundance, however many new woodlands we plant.**



# Summary of Plantlife response to the Independent Panel on Forestry, July 2011

The 'Lawton Review' concluded that England's protected wildlife sites, taken *in toto,* did not comprise a coherent and resilient ecological network; the essence of what needs to be done was summed up in four words: **more**, **bigger**, **better** and **joined**.[32] This philosophy applies as much to our native woodland as it does to other habitats. However, despite the significant expansion in woodland cover in Britain, there has been a marked decline in specialist woodland plants and other wildlife.

Plantlife supports the targeted creation of new woodland, where there is a clear conservation benefit. In short, the focus should be on quality, not quantity, operating the principle of 'right tree, right place, right reason'.

The importance of the 258,000 hectare Public Forest Estate (PFE) cannot be overstressed for wild plants. Thus, of England's local, rare and declining wild flowers, **208 out of the 588 taxa** occur within the PFE.

# The importance of the 258,000 hectare Public Forest Estate cannot be overstressed for wild plants

We believe that this invaluable national asset presents a unique opportunity for demonstrating and undertaking exemplary protection and management, be it the restoration and active management of ancient semi-natural woodland or the realisation of open habitat potential on the scale necessary to deliver landscape scale conservation through the removal of plantation forestry.

Whilst in theory ownership of this estate is not in itself the key issue, but rather the effective sustainable management of the resource itself, Plantlife does not believe that the incentives, resources and adequate expertise are yet available to the private sector to deliver such conservation aspirations. Instead, we support the management of much of the PFE as falling within the remit of a Forestry Commission whose remit has been completely reviewed to better reflect the aspirations of the general public in terms of effective delivery of conservation of biodiversity, landscape and cultural heritage, as well as the provision of widespread public access.

# Britain's threatened and near threatened woodland vascular plant species

| Species | Red Data Book | Rarity | *New Atlas of the British and Irish Flora*, Preston *et al.* (2002). |
|---|---|---|---|
| *Arum italicum* subsp. *neglectum* | Near Threatened | Scarce | The distribution of this subspecies as a native plant is probably stable |
| *Campanula patula* | Endangered | Scarce | -0.77. It has since disappeared from many sites through the cessation of coppicing and other disturbance in woodland, and the increased use of herbicides on roadsides and railway banks. |
| *Cardamine impatiens* | Near Threatened | Scarce | -0.09. Populations fluctuate markedly from year to year and from site to site, but the overall distribution of this species is stable |
| *Carex depauperata* | Endangered | Rare | Woodland removal or lack of woodland management probably account for the decline of this species in Britain. It responds well to coppicing and periodic disturbance. |
| *Cephalanthera damasonium* | Vulnerable | Not Scarce | -0.94. Clearance of woodland, particularly since 1930, has resulted in the loss of many sites for *C. damasonium.* |
| *Cephalanthera longifolia* | Vulnerable | Scarce | -0.77. This species declined markedly in the 19th and 20th centuries, especially before 1970. Although collecting may have contributed to some losses, cessation of woodland management and coniferisation, both leading to denser canopies, are much more significant. |
| *Cephalanthera rubra* | Critically Endangered | Rare | This elusive species has always been rare and is now found at only three sites, with a total of perhaps only thirty plants. Current conservation management includes removal of shrubs and trees. |
| *Clinopodium menthifolium* | Critically Endangered | Rare | Although once abundant, the cessation of coppicing in the 1940s led to a marked decline, but this has been stemmed by the resumption of coppicing and the clearance of invasive ground-cover and more nutrient demanding tall herbs such as *Eupatorium cannabinum* and *Urtica dioica.* |
| *Colchicum autumnale* | Near Threatened | | -0.14. Further losses have occurred since then, especially from meadows, but it remains frequent within its core area. |
| *Corallorhiza trifida* | Vulnerable | Scarce | +0.61. *C. trifida* is easily overlooked and new sites are still being found; it is much better recorded now than in the 1962 Atlas. |

## Britain's threatened and near threatened woodland vascular plant species —continued

| | | | |
|---|---|---|---|
| *Cynoglossum germanicum* | Critically Endangered | Rare | -0.52. The marked decline of this species before 1930 was shown in the 1962 Atlas. The reasons for it are unclear, but it may be more apparent than real as many old records appear to have been of transient populations. Further sites have been lost since 1930, but the great storm of 1987 opened up its woodland habitats, and since then huge populations have been recorded in Surrey. |
| *Cypripedium calceolus* | Critically Endangered | Rare | This species suffered many losses due to collecting, mostly during the 19th century. |
| *Daphne mezereum* | Vulnerable | Scarce | -0.06. Native populations have suffered from habitat loss and uprooting, |
| *Epipogium aphyllum* | Critically Endangered | Rare | The site at which it was last seen is now a commercial forest planted with conifers. |
| *Fallopia dumetorum* | Vulnerable | Scarce | -0.33. It seems to have declined since the 1962 Atlas, probably due to a lack of woodland management |
| *Hymenophyllum wilsonii* | Near Threatened | Not Scarce | -0.87. The distribution of ***H. wilsonii*** is largely stable. |
| *Lamiastrum galeobdolon* subsp. *galeobdolon* | Vulnerable | Rare | |
| *Luzula pallidula* | Critically Endangered | Rare | ***L. pallidula*** is possibly now extinct, having been last recorded in 1992 at Woodwalton Fen (Hunts.). However, it is likely that a soil seed bank still exists and this might give rise to populations following renewed peat disturbance. |
| *Maianthemum bifolium* | Vulnerable | Rare | +0.32. Records from the 17th century suggest that it was formerly more abundant and widespread, but extant populations tend to be isolated and very small, although stable. |
| *Melampyrum cristatum* | Vulnerable | Rare | -0.88. Much of the loss of ***M. cristatum*** had taken place before 1930, but the range has further contracted since then, with losses occurring through the cessation of traditional woodland management, and herbicide spraying of verges and field-borders. |
| *Melampyrum sylvaticum* | Endangered | Scarce | -0.58. This species has declined most in the southern and lowland parts of its range, and especially in N. Ireland where many losses occurred before 1930. Afforestation, nutrient enrichment, grazing and trampling by livestock have contributed to its decline. |

## Britain's threatened and near threatened woodland vascular plant species —continued

| | | | |
|---|---|---|---|
| *Melittis melissophyllum* | Vulnerable | Scarce | -0.47. The distribution of *M. melissophyllum* in Devon and Cornwall is apparently stable. However, it has declined markedly in the New Forest and Dorset over the past twenty years as a result of overshading and pony grazing, although at some sites it has reappeared after scrub clearance and coppicing. |
| *Moneses uniflora* | Vulnerable | Rare | +0.14. Diminished by past collection, this attractive species has continued to decline through changes in land use and forest management. Much of this decline took place before 1970, but its future is dependent on sympathetic management. |
| *Monotropa hypopitys* | Endangered | | -1.09. Although many sites were lost before 1930, the species has suffered a further marked decline in S. England since the 1962 Atlas. |
| *Neottia nidus-avis* | Near Threatened | Not Scarce | -0.91. *N. nidus-avis* suffered a considerable decline throughout the 20th century, but particularly between 1930 and 1970, and especially in S.E. England. It is very vulnerable to habitat disruption, and most losses are probably due to changes in woodland management and coniferisation. |
| *Ophrys insectifera* | Vulnerable | Not Scarce | -1.34. This species declined dramatically before 1930, especially in East Anglia. Since then the losses have continued, but at a reduced rate. Most losses are due to scrub encroachment, the closing of woodland canopies, woodland clearance. |
| *Orchis militaris* | Vulnerable | Rare | Habitat destruction and collecting caused a decline in this species until it was considered extinct in the 1920s. It was re-found in Buckinghamshire in 1947 and Suffolk in 1954, where populations are stable, and it appears sporadically in two Oxfordshire sites. |
| *Orchis purpurea* | Endangered | Scarce | -0.56. This species suffered losses in its core Kent area, largely before 1930, but now appears to be stable there. |
| *Phyteuma spicatum* | Endangered | Rare | -0.73. It was formerly more widespread and more abundant within this stronghold. It cannot tolerate shade and has disappeared from many sites through a lack of coppicing. |
| *Platanthera chlorantha* | Near Threatened | Not Scarce | -0.88. *P. chlorantha* was lost from many sites during the 20th century. Reasons include the felling, disturbance and coniferisation of woodland, and the agricultural improvement of pasture and scrub. It may be lost from woodland if the canopy becomes too dense. |
| *Polygonatum verticillatum* | Vulnerable | Rare | The distribution of *P. verticillatum* is stable, though some populations have been lost through erosion and habitat destruction. Flowering seems to be restricted by excessive shading at a number of localities and limited opportunities for cross-pollination further restrict seed production. |

## Britain's threatened and near threatened woodland vascular plant species —continued

| | | | |
|---|---|---|---|
| *Primula elatior* | Near Threatened | Scarce | +0.01. Agricultural improvement has all but eliminated this species from meadows since 1930, and in woodland numbers are reduced when coppicing ceases or conifers planted. Recently, increasing numbers of flowers have been eaten by deer. |
| *Pulmonaria obscura* | Endangered | Rare | It has declined in two woods since the 1930s due to the cessation of coppicing, and has been lost from another through habitat destruction. |
| *Pyrola media* | Vulnerable | Scarce | -1.09. Recently unfavourable woodland management and increased moorland grazing may have contributed to some losses. |
| *Pyrola rotundifolia* subsp. *rotundifolia* | Near Threatened | Scarce | -0.08. This subspecies has undergone a marked decline since 1930, despite some local increases in disused quarries. Reasons for the losses include afforestation and rubbish tipping, but the most serious declines, such as its near extinction in East Anglia, result from changes in fen management. |
| *Sorbus anglica* | Near Threatened | Rare | The distribution and populations of *S. anglica* appear to be stable. |
| *Sorbus bristoliensis* | Endangered | Rare | This species is very localised, occurring on both sides of the Avon Gorge where the total population of about a hundred trees may be increasing in response to conservation management. |
| *Sorbus domestica* | Critically Endangered | Rare | This species was originally known as a single tree in the Wyre Forest (Worcs.), first described in 1678. Five trees now exist near there, these probably being cuttings from the original. However, its wild coastal-cliff habitat was discovered in 1973, and 22 trees are now known in Wales and 8 in England. |
| *Sorbus eminens* | Endangered | Rare | No comment |
| *Sorbus lancastriensis* | Near Threatened | Rare | The distribution and population size appear to be stable. |
| *Sorbus leyana* | Critically Endangered | Rare | Approximately twenty trees of this species are known, in two very localised populations about a kilometre apart. Saplings are vigorous when grown in cultivation from wild seed, and some of them have been planted at one of the native sites (Penmoelallt, Brecs.) to bolster the natural population of only three trees. |
| *Sorbus subcuneata* | Vulnerable | Rare | The population appears to be generally stable. |
| *Sorbus vexans* | Endangered | Rare | he total population probably numbers a hundred or more trees, and has undergone no substantial change since the species was described in 1957. |
| *Sorbus wilmottiana* | Critically Endangered | Rare | It has always been rare, and the population currently comprises only a few trees. |

# Britain's threatened and near threatened woodland lichens

| Taxon | Status | Rarity |
|---|---|---|
| *Alectoria sarmentosa* subsp. *sarmentosa* | Near Threatened | Scarce |
| *Anaptychia ciliaris* subsp. *ciliaris* | Endangered | Scarce |
| *Arctomia delicatula* | Near Threatened | Rare |
| *Arthonia anglica* | Endangered | Rare |
| *Arthonia astroidestera* | Near Threatened | Scarce |
| *Arthonia ilicinella* | Near Threatened | Scarce |
| *Arthonia patellulata* | Near Threatened | Scarce |
| *Arthonia zwackhii* | Near Threatened | Rare |
| *Arthopyrenia atractospora* | Near Threatened | Rare |
| *Arthothelium dictyosporum* | Near Threatened | Rare |
| *Arthothelium macounii* | Vulnerable | Rare |
| *Bacidia circumspecta* | Vulnerable | Scarce |
| *Bacidia igniarii* | Vulnerable | Rare |
| *Bacidia incompta* | Vulnerable | |
| *Bacidia subincompta* | Vulnerable | Scarce |
| *Bacidia subturgidula* | Critically Endangered | Rare |
| *Bacidia vermifera* | Endangered | Rare |
| *Bactrospora dryina* | Critically Endangered | Rare |
| *Biatoridium delitescens* | Vulnerable | Rare |
| *Biatoridium monasteriense* | Endangered | Rare |
| *Blarneya hibernica* | Near Threatened | Rare |
| *Bryoria furcellata* | Vulnerable | Rare |
| *Bryoria smithii* | Critically Endangered | Rare |
| *Buellia arnoldii* | Near Threatened | Rare |
| *Buellia hyperbolica* | Vulnerable | Rare |
| *Buellia violaceofusca* | Near Threatened | Rare |
| *Calicium adspersum* | Critically Endangered | Rare |
| *Calicium diploellum* | Critically Endangered | Rare |
| *Calicium hyperelloides* | Critically Endangered | Rare |
| *Calicium parvum* | Near Threatened | Rare |
| *Caloplaca flavorubescens* | Endangered | Scarce |
| *Caloplaca herbidella* | Vulnerable | Rare |
| *Caloplaca lucifuga* | Vulnerable | Rare |
| *Caloplaca luteoalba* | Endangered | Scarce |
| *Caloplaca virescens* | Endangered | Scarce |
| *Catapyrenium psoromoides* | Critically Endangered | Rare |
| *Catinaria neuschildii* | Vulnerable | Rare |
| *Chaenotheca chlorella* | Near Threatened | Scarce |
| *Chaenotheca gracilenta* | Endangered | Rare |
| *Chaenotheca laevigata* | Endangered | Rare |
| *Chaenotheca xyloxena* | Vulnerable | Rare |
| *Chaenothecopsis savonica* | Near Threatened | Rare |
| *Chrysothrix chrysophthalma* | Near Threatened | Rare |
| *Cladonia botrytes* | Critically Endangered | Scarce |

# Britain's threatened and near threatened woodland lichens —continued

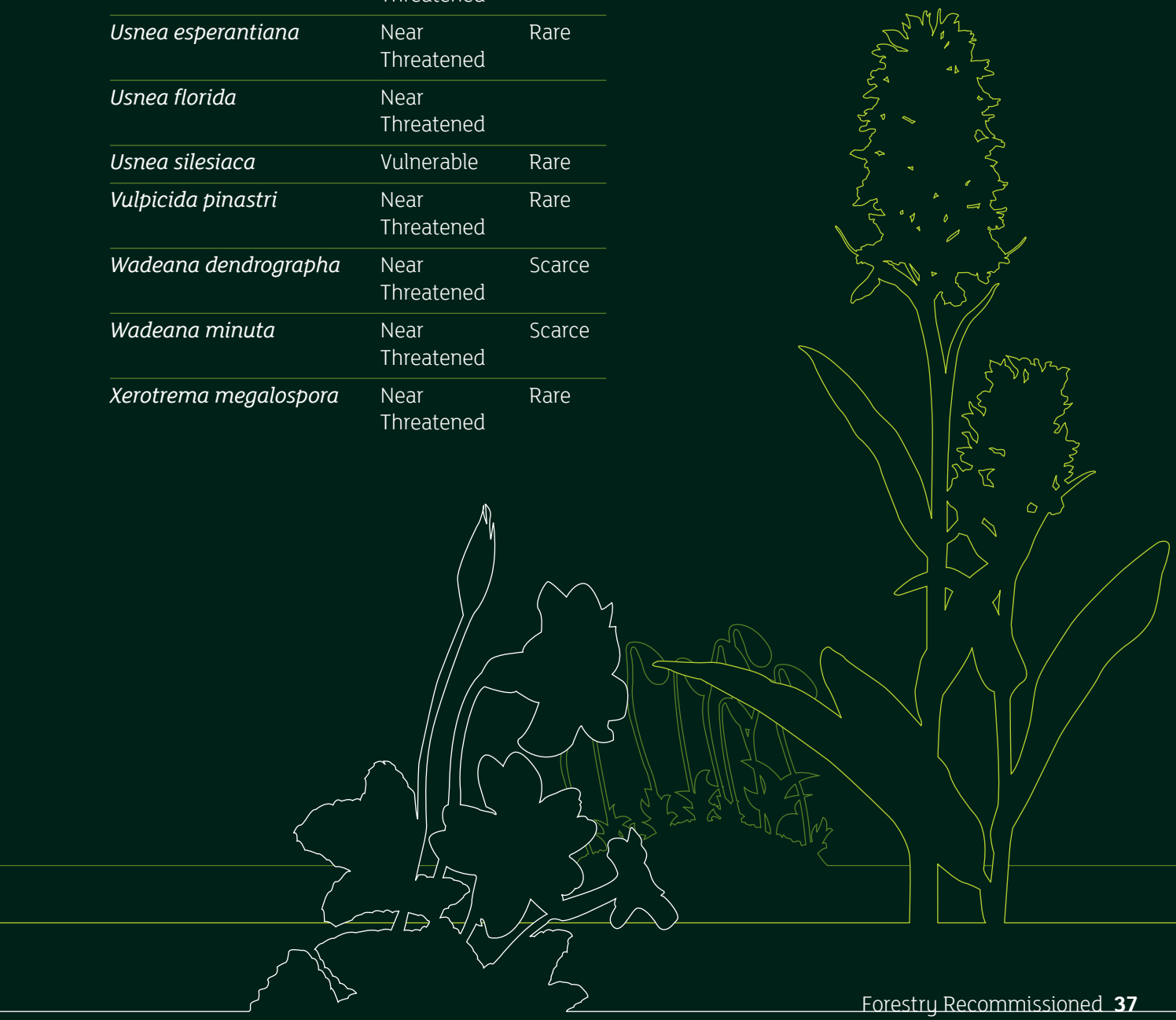
| | | |
|---|---|---|
| *Cladonia cenotea* | Near Threatened | Rare |
| *Collema fasciculare* | Near Threatened | Scarce |
| *Collema fragrans* | Endangered | Rare |
| *Collema nigrescens* | Near Threatened | Scarce |
| *Collema occultatum* | Near Threatened | Scarce |
| *Cryptolechia carneolutea* | Endangered | Scarce |
| *Cyphelium tigillare* | Near Threatened | Rare |
| *Elixia flexella* | Near Threatened | Rare |
| *Enterographa elaborata* | Critically Endangered | Rare |
| *Enterographa sorediata* | Near Threatened | Scarce |
| *Fuscopannaria ignobilis* | Vulnerable | Scarce |
| *Fuscopannaria praetermissa* | Near Threatened | Rare |
| *Fuscopannaria sampaiana* | Near Threatened | Scarce |
| *Gomphillus calycioides* | Near Threatened | Scarce |
| *Graphina pauciloculata* | Vulnerable | Rare |
| *Graphis alboscripta* | Near Threatened | Rare |
| *Gyalecta flotowii* | Near Threatened | Scarce |
| *Gyalecta ulmi* | Endangered | Rare |
| *Hertelidea botryosa* | Near Threatened | Rare |
| *Heterodermia leucomela* | Endangered | Rare |
| *Heterodermia obscurata* | Near Threatened | Scarce |
| *Heterodermia speciosa* | Critically Endangered | Rare |
| *Hypocenomyce anthracophila* | Endangered | Rare |
| *Hypogymnia farinacea* | Near Threatened | Rare |
| *Lecania chlorotiza* | Near Threatened | Scarce |
| *Lecania dubitans* | Near Threatened | Rare |
| *Lecanographa amylacea* | Vulnerable | Scarce |
| *Lecanora cinereofusca* | Vulnerable | Rare |
| *Lecanora horiza* | Near Threatened | Scarce |
| *Lecanora mughicola* | Near Threatened | Rare |
| *Lecanora populicola* | Near Threatened | Scarce |
| *Lecanora quercicola* | Near Threatened | Scarce |
| *Lecanora sublivescens* | Near Threatened | Scarce |
| *Lecidea erythrophaea* | Vulnerable | Rare |
| *Lecidea globulispora* | Vulnerable | Rare |
| *Lecidea leprarioides* | Near Threatened | Rare |
| *Leptogium brebissonii* | Near Threatened | Scarce |
| *Leptogium cochleatum* | Vulnerable | Scarce |
| *Leptogium coralloideum* | Vulnerable | Rare |
| *Leptogium hibernicum* | Near Threatened | Rare |
| *Leptogium saturninum* | Vulnerable | Scarce |
| *Lithothelium phaeosporum* | Near Threatened | Rare |
| *Megalaria laureri* | Endangered | Rare |
| *Megalospora tuberculosa* | Near Threatened | Scarce |
| *Micarea elachista* | Endangered | Rare |

## Britain's threatened and near threatened woodland lichens —continued

| | | |
|---|---|---|
| *Micarea hedlundii* | Near Threatened | Rare |
| *Nephroma tangeriense* | Near Threatened | Rare |
| *Opegrapha prosodea* | Near Threatened | Scarce |
| *Opegrapha trochodes* | Near Threatened | Rare |
| *Pachyphiale fagicola* | Near Threatened | Rare |
| *Parmeliella testacea* | Near Threatened | Scarce |
| *Parmelina carporrhizans* | Vulnerable | Scarce |
| *Parmelinopsis horrescens* | Near Threatened | Scarce |
| *Parmelinopsis minarum* | Near Threatened | Rare |
| *Parmotrema arnoldii* | Near Threatened | Scarce |
| *Parmotrema robustum* | Critically Endangered | Rare |
| *Pertusaria pustulata* | Vulnerable | Rare |
| *Pertusaria velata* | Vulnerable | Scarce |
| *Phaeographis lyellii* | Near Threatened | Scarce |
| *Phlyctis agelaea* | Near Threatened | Scarce |
| *Physcia clementei* | Near Threatened | Scarce |
| *Physcia tribacioides* | Vulnerable | Scarce |
| *Polychidium dendriscum* | Vulnerable | Rare |
| *Porina effilata* | Critically Endangered | Rare |
| *Porina hibernica* | Near Threatened | Scarce |
| *Porina leptospora* | Near Threatened | Rare |
| *Porina rosei* | Near Threatened | Scarce |
| *Pseudocyphellaria aurata* | Critically Endangered | Rare |
| *Pseudocyphellaria intricata* | Near Threatened | Scarce |
| *Pseudocyphellaria lacerata* | Vulnerable | Rare |
| *Ptychographa xylographoides* | Near Threatened | Scarce |
| *Pycnora xanthococca* | Vulnerable | Rare |
| *Pyrenula acutispora* | Near Threatened | Rare |
| *Pyrenula dermatodes* | Critically Endangered | Rare |
| *Pyrenula hibernica* | Vulnerable | Rare |
| *Pyrenula nitida* | Vulnerable | Rare |
| *Ramonia chrysophaea* | Near Threatened | Scarce |
| *Ramonia dictyospora* | Near Threatened | Scarce |
| *Ramonia nigra* | Critically Endangered | Rare |
| *Rinodina colobinoides* | Vulnerable | Rare |
| *Rinodina degeliana* | Vulnerable | Rare |
| *Rinodina flavosoralifera* | Near Threatened | Rare |
| *Rinodina isidioides* | Near Threatened | Scarce |
| *Schismatomma graphidioides* | Vulnerable | Scarce |
| *Sclerophora pallida* | Vulnerable | Scarce |
| *Sclerophora peronella* | Near Threatened | Scarce |
| *Sticta canariensis independ. green morph* | Vulnerable | Rare |
| *Strangospora microhaema* | Near Threatened | Scarce |

## Britain's threatened and near threatened woodland lichens —continued

| | | |
|---|---|---|
| *Strigula stigmatella* var. *stigmatella* | Endangered | Rare |
| *Strigula thelopsidoides* | Near Threatened | Rare |
| *Teloschistes chrysophthalmus* | Critically Endangered | Rare |
| *Teloschistes flavicans* | Vulnerable | Scarce |
| *Thelenella larbalestieri* | Vulnerable | Rare |
| *Thelenella modesta* | Critically Endangered | Rare |
| *Topeliopsis azorica* | Endangered | Rare |
| *Usnea articulata* | Near Threatened | |
| *Usnea esperantiana* | Near Threatened | Rare |
| *Usnea florida* | Near Threatened | |
| *Usnea silesiaca* | Vulnerable | Rare |
| *Vulpicida pinastri* | Near Threatened | Rare |
| *Wadeana dendrographa* | Near Threatened | Scarce |
| *Wadeana minuta* | Near Threatened | Scarce |
| *Xerotrema megalospora* | Near Threatened | Rare |



# Britain's threatened and near threatened woodland bryophytes

| Group | Taxon | Common name | Status | Rarity |
|---|---|---|---|---|
| liverwort | *Jungermannia leiantha* | [Type of] Flapwort | Critically Endangered | Rare |
| liverwort | *Lejeunea mandonii* | Atlantic Pouncewort | Endangered | Rare |
| liverwort | *Lophozia longiflora* | Reddish Notchwort | Critically Endangered | Rare |
| liverwort | *Radula carringtonii* | Carrington's Scalewort | Vulnerable | Rare |
| liverwort | *Telaranea nematodes* | [type of] Threadwort | Endangered | Rare |
| moss | *Anomodon attenuatus* | Slender Tail-moss | Critically Endangered | Rare |
| moss | *Anomodon longifolius* | Long-leaved Tail-moss | Endangered | Rare |
| moss | *Atrichum angustatum* | Lesser Smoothcap | Critically Endangered | Scarce |
| moss | *Bryum gemmilucens* | Yellow-bud Bryum | Near Threatened | Scarce |
| moss | *Buxbaumia viridis* | Green Shield-moss | Endangered | Rare |
| moss | *Campylopus subporodictyon* | Rusty Bow-moss | Near Threatened | Rare |
| moss | *Daltonia splachnoides* | Irish Daltonia | Vulnerable | Rare |
| moss | *Homomallium incurvatum* | Incurved Feather-moss | Critically Endangered | Rare |
| moss | *Orthodontium gracile* | Slender Thread-moss | Vulnerable | Rare |
| moss | *Orthotrichum consimile* | [type of] Bristle-moss | Critically Endangered | Rare |
| moss | *Orthotrichum obtusifolium* | Blunt-leaved Bristle-moss | Vulnerable | Rare |
| moss | *Orthotrichum pumilum* | Dwarf Bristle-moss | Endangered | Rare |
| moss | *Orthotrichum speciosum* | Showy Bristle-moss | Near Threatened | Rare |
| moss | *Rhytidiadelphus subpinnatus* | Scarce Turf-moss | Endangered | Rare |
| moss | *Seligeria campylopoda* | Bentfoot Rock-bristle | Vulnerable | Rare |
| moss | *Sematophyllum demissum* | Prostrate Signal-moss | Vulnerable | Rare |
| moss | *Sematophyllum substrumulosum* | Bark Signal-moss | Near Threatened | Rare |
| moss | *Weissia multicapsularis* | Many-fruited Beardless-moss | Critically Endangered | Rare |
| moss | *Weissia squarrosa* | Spreading-leaved Beardless-moss | Vulnerable | Scarce |
| moss | *Zygodon forsteri* | Knothole Yoke-moss | Endangered | Rare |

# Endnotes

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**Speaking up for the nation's wild plants.**
We work hard to protect wild plants and to build understanding of the vital role they play in everyone's lives. Wild plants clean our air and water, provide food and shelter for our insects, birds and animals, and are critical in the fight against climate change.