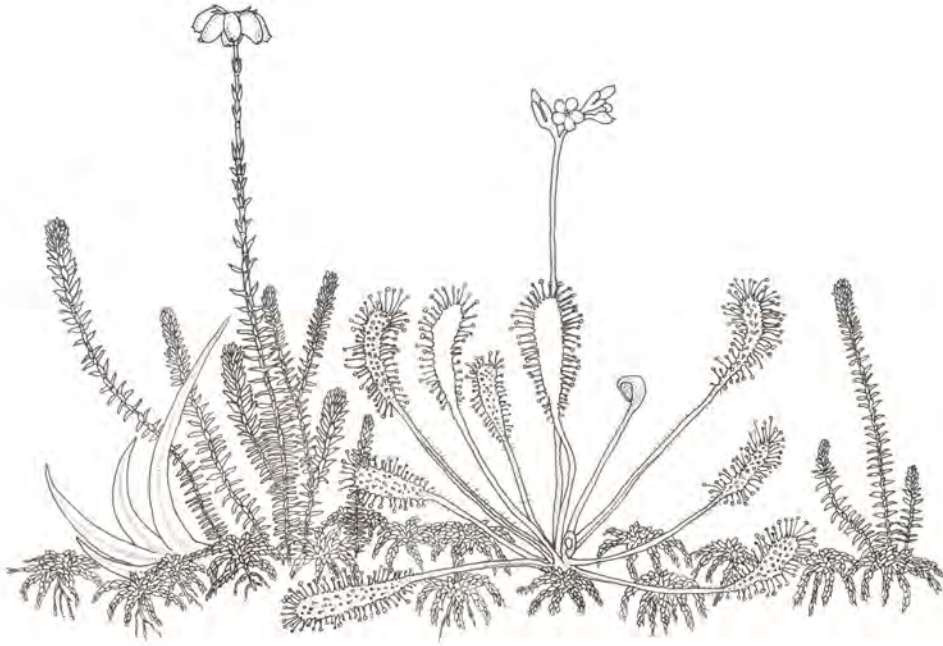


A Vascular Plant Red List for England



Drosera anglica Huds. © Jonathan J. Graham

Drosera anglica is illustrated here and pictured on the front cover not simply because it has an apt name for this report. Regrettably, the loss of this species from many of its historical locations is emblematic of the plight in England of many small specialist species of highly infertile soils, such as *Erica tetralix* with which it is pictured. *Drosera anglica* was once relatively widespread and

scattered across lowland England, but a combination of many factors including peat digging, eutrophication and technological advances in land drainage resulted in rapid, widespread and irreversible habitat loss and the fragmentation of populations, so much so that *D. anglica* is now considered to be 'Endangered' in England.

A Vascular Plant Red List for England

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With assistance from England Vice-County Recorders of the Botanical Society of
Britain and Ireland

1 Botanical Society of Britain and Ireland

2 Natural England

3 Centre for Ecology and Hydrology

4 Natural History Museum

5 Royal Botanic Garden Kew

6 Plantlife



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Summary

The results detailed in this vascular plant Red List present for the first time the current state of England's flora measured against standardised IUCN criteria. Almost one in five species has been assessed as threatened, with many more species assessed as 'Near Threatened'. The destruction and transformation of semi-natural habitats across the English landscape since the publication of the first *Atlas of the British Flora* (Perring & Walters 1962) is well known, and these changes are mirrored not only in the long list of taxa assessed as threatened in England

but also in the decline in distribution by 20% or more of a suite of 'Near Threatened' species, some of which were previously assumed to be widespread and with relatively stable distributions. The strategic approach advocated by Lawton *et al.* (2010) to restore, create and connect extant habitats at the landscape scale is essential if the declines identified in this and other Red Lists are to be arrested. Such an approach demands long-term commitment, considerable resources and a recognition of the benefits to be gained from a more diverse and adaptable environment.

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'It cannot be said too often that it is as much the conservationist's job to keep common species common as it is to ensure the survival of rare species.'

N.W. Moore (1987)

1 Introduction

A Red List uses a globally recognised and scientifically rigorous approach designed by the International Union for the Conservation of Nature (IUCN) to assess and determine risks of extinction. The method is applicable to all species and provides information on status, trends and threats.

The production of a first vascular plant Red List for England follows similar Lists for Great Britain (Cheffings & Farrell 2005) and Wales (Dines 2008) that have examined changes to our flora since 1930 and identified those species most at risk. The threat to all native and archaeophyte taxa in England is assessed using the same standardised IUCN criteria, thresholds and categories as for the Great Britain (GB) and Wales Red Lists, but the model used to calculate distribution trends has been replaced by a more sensitive one that accounts for spatial and temporal differences in recorder effort (see Section 4.6).

Although this has the benefit of increased confidence in the results, it also means that comparisons between GB and England threat statuses should be treated with some caution. Wherever possible an explanation is given in the comments column on the Main List (Section 8) or within the text (e.g. Section 6.9.1) where clear anomalies have arisen.

This vascular plant Red List for England (from now on referred to as the *England Red List*) has been produced by the Botanical Society of Britain and Ireland (BSBI) and the Centre for Ecology and Hydrology (CEH). The research and writing of the report was funded by Natural England and co-ordinated by a project steering group comprising representatives from the BSBI, Natural England, Natural History Museum, Royal Botanic Gardens Kew, Plantlife, and CEH, Wallingford. Design and publication of this Red List was funded by CEH and the BSBI. As is the case



The River Mimram in Hertfordshire (Roger Cave).

with all vascular plant Red Lists covering regions within Britain and Ireland, this work would not have been possible without the underlying field data collected in all weathers over many thousands of hours of voluntary time by skilled BSBI Vice-County Recorders, other voluntary field workers and amateur enthusiasts.

It is hoped that the *England Red List* will be of use to a wide range of organisations and individuals. For example, it will help Natural England to identify additional country-level priority taxa requiring conservation action, whether through appropriate management of Sites of Special Scientific Interest (SSSI), designation of new SSSIs, targeting of agri-environment schemes and land management advice in the 'wider countryside', or projects funded by the Species Recovery Programme (SRP). England threat statuses may also be useful when assessing species priorities on Wildlife Trust and other Non-Governmental Organisation (NGO) nature reserves, or when identifying 'second-tier' wildlife sites, and will be helpful to BSBI Vice-county Recorders (VCRs) in England when compiling County Rare Plant Registers (RPR). However, it is important to note that the England threat status of a taxon should not be used in isolation from its GB threat status. Dines (2008) clarified the IUCN guidance on Regional Red Lists regarding the application of regional assessments versus national assessments in a vascular plant Red Data List for Wales (from now on referred to as the *Wales Red List*), and this guidance is reiterated below for England.

- Any taxon that is threatened – Critically Endangered (**CR**), Endangered (**EN**), Vulnerable (**VU**) – or Near Threatened (**NT**) in GB should also be regarded as a priority for conservation in England, regardless of its threat status in England

- It therefore follows that if a taxon is assessed here as being less threatened in England than it is in GB as a whole, its overall priority for conservation action in England should be determined by its GB threat status rather than by its status in England
- Taxa that are more threatened in England than they are in Great Britain should naturally be considered as high priorities for conservation action within England, even though it is accepted that they may be considered a lower priority elsewhere in GB

When interpreting this *England Red List*, it is important to recognise that while the results add greatly to our knowledge regarding the extinction risk to the English flora, those taxa that have not been assessed as threatened or **NT** using IUCN criteria may still be of conservation concern (see for example Section 6.7). In addition, it should be noted that 'threat' is not synonymous with 'rarity'. Within GB and England, a taxon is considered 'rare' or 'scarce' if it is present below a certain number of 10km x 10km squares (hectads): for GB the thresholds have long been set at ≤15 hectads for 'rare' and ≤100 hectads for 'scarce', while for England the equivalent thresholds, adjusted to area, are ≤8 and ≤52 (see Stroh 2014). A 'threat' status, on the other hand, is based on spatial and temporal trends and also, where appropriate, the number of locations and/or individuals (see Section 4.3). 'Threat' can be assessed for any taxon, regardless of the number of hectads in which it occurs; it is a measure of the risk of that taxon becoming extinct, not a reflection of how rare or scarce it may be. We have taken the decision not to include in Section 8 of this Red List an additional column that lists the 'rare' or 'scarce' status for taxa that meet the hectad thresholds defined above, but we accept that many 'rare' or 'scarce' taxa may still be of conservation concern.

2 Coverage

2.1 Taxonomic coverage

Except where stated, all native and archaeophyte angiosperms (flowering plants), gymnosperms (conifers) and pteridophytes (fern and fern allies) found in England have been assessed. *Hieracium* and *Taraxacum* microspecies are included in the Main List when there is adequate information for an England threat status to be assigned (see Dudman & Richards 1997, McCosh & Rich 2011, Rich 2013a and Appendix A), but *Rubus* microspecies are not included (see Section 6.9.1). Although this Red List, like those for GB and Wales, takes a species-based approach when assessing threat, in recent years models that complement the current system but incorporate a measure of phylogenetic diversity (PD) have been tested to help prioritise further the conservation of species (see Isaac *et al.* 2007, Pearse *et al.* in press). By incorporating PD, for example, the extinction of a species or clade with millions of years of evolutionary history would be perceived as resulting in a greater loss of biodiversity than the extinction of a young species with many close relatives, and consequently would attain a higher priority for conservation action. For many reasons this Red List follows the IUCN protocols and species-based approach used globally by all other Red Lists, but as models are tested and refined for vascular plants it becomes more probable that the next revision of the vascular plant Red List for Great Britain (from now on referred to as the *GB Red List*) and regional Red Lists within GB will adopt some measure of PD.

A native plant is defined as one that has not been deliberately or accidentally introduced by man (Stace *et al.* 2003; but see Section 2.4). All other taxa are regarded as alien.

This category can be subdivided by the time which has elapsed since the first introduction: an *archaeophyte* is an alien species which is known or suspected to have become naturalised before AD 1500, whereas a *neophyte* is one that was probably introduced after AD 1500 (Preston *et al.* 2004). Except where explicitly stated, the national native and archaeophyte status for the taxa included in this Red List follow those given in the *New Atlas of the British & Irish flora* (Preston *et al.* 2002). Neophytes are excluded from the *England Red List*, as are species that only occur as 'casuals', i.e. introduced species with populations that fail to persist in the wild for more than a few years. A number of species are categorised in the *GB Red List* as 'native or alien' or 'neophyte or archaeophyte'. In such instances, we have followed a precautionary approach and treated these as either 'native' or 'archaeophyte' respectively. Species that are native to other parts of GB but are considered neophytes or casuals in England are excluded from the Main List but are listed in Section 9 as 'Not Assessed'.

To assess the extinction threat of relevant taxa at a regional scale, it was first necessary to compile a 'candidate list' of all native and archaeophyte taxa occurring in England, with nomenclature following Stace (2010). Both the *GB Red List* and the *Wales Red List* were published before Stace (2010) and numerous taxonomic and nomenclatural changes have taken place since the publication of Stace (1997). For example, the genera *Lychnis*, *Lavatera* and *Aceras* are now subsumed into *Silene*, *Malva* and *Orchis* respectively, the three subspecies of *Carex viridula* revert to their former (species-level) names, broad-leaved fescues (*Festuca pratensis*, *F. arundinacea* and *F. gigantea*) are moved to the genus *Schedonorus*, and three species

of *Peucedanum* formerly grouped together according to their fruit morphology are now split into three separate genera with *P. palustre* moving to the genus *Thyselium* (Sanford 2010). For ease of reference between all three Red Lists, when a nomenclatural change has occurred between the second (1997) and third (2010) editions of Stace, then the former name is included in this *England Red List* in parentheses.

2.2 'New Native' species

'New natives' are taxa that have recently colonised England via natural dispersal, are newly evolved, or newly described. In order to be categorised as a new native, evidence must also establish that the taxon is not of casual occurrence (i.e. present for less than five years).

Occasionally, potential new native taxa that may have arrived via natural dispersal are kept on a Waiting List (**WL**) until such time as doubts over their native/alien status are resolved. For example, *Pancratium maritimum* was added to the GB **WL** in the Year 5 *GB Red List* amendments (Leach & Walker 2011) as a possible natural colonist after being recorded in sand-dunes near Penzance, West Cornwall, and Slapton, South Devon. This 'England-only' species is included on the England **WL** too pending further study, including molecular work that might determine the most likely origins of these new populations.

A small number of recently described new natives are included in the England Main List (Section 8) and have been assessed in the normal way. They include *Bolboschoenus laticarpus*, a newly described taxon (Marhold *et al.* 2004) of freshwater inland habitats (e.g. lowland floodplains and the edges of reservoirs within littoral 'drawdown' zones) that is also recorded as a prolific arable

weed in central and eastern Europe. Its seed is probably dispersed by birds and water, and germination and establishment is high following dispersal to areas providing favourable conditions (Hroudová *et al.* 2007). The species is very similar in appearance to *B. maritimum* and it is likely to be relatively widespread but under-recorded in England, hence an assessment of Least Concern (**LC**) (i.e. not threatened or Near Threatened) in the Year 6 & 7 amendments to the *GB Red List* (Leach & Walker 2013).

One other notable recent find, *Carex cespitosa*, could not be considered a 'new native' in the strictest sense (i.e. it is neither newly described, newly evolved or has arrived via natural dispersal) because it was already a part of the English flora but had previously been overlooked. *Carex cespitosa* was discovered for the first time in GB at a single site in Hertfordshire (James *et al.* 2012). This record, together with populations in Spain, represents the western limit of the global distribution for a species that is threatened throughout much of western Europe.

2.3 Alien status

The *England Red List* follows the alien status categories given to taxa in Preston *et al.* (2002) and as adopted by Cheffings & Farrell (2005) except in cases where the status of a taxon has been subsequently modified in updates to the *GB Red List* (Leach 2007, 2010; Leach & Walker 2011, and 2013). For example, several taxa have recently been moved from the GB **WL** to the GB Main List (**ML**) following re-assessment of their native/alien or archaeophyte/neophyte status by the GB Species Status Assessment Group (SSAG) (e.g. *Equisetum ramosissimum*, *Heracleum sphondylium* subsp. *flavescens*, *Melampyrum arvense*, *Petrorhagia prolifera*, *Rhinanthus angustifolius*, *Vulpia unilateralis*). These are included in the **ML** of the *England Red List*.

Several taxa previously on the GB **ML** have been moved by the SSAG to the GB **WL** (or de-listed altogether) due to doubts over their native status, e.g. *Fritillaria meleagris* (Pearman 2007, 2013; Leach 2010) and *Symphytum tuberosum* (Pearman

2007; Leach 2010; Leach & Walker 2013). Conversely, some taxa are now considered to have greater claim to native status than previously thought, the SSAG moving them from the GB **WL** to the GB **ML**, e.g. *Equisetum ramosissimum*, *Petrorhagia*

prolifera and *Vulpia unilateralis* (Leach & Walker 2013). In all such cases, for the *England Red List* we have adopted the latest decisions of the GB SSAG with regard to native/alien status.

2.4 Hybrids

There is no specific IUCN guidance for assessing hybrids, even though hybridisation followed by polyploidy is one of the main mechanisms in plant speciation and hybrids have an essential role to play in plant evolutionary processes. The GB and Wales Red Lists included hybrids in threat assessments based on six criteria as summarised in Cheffings & Farrell (2005, pp.10-11). However, hybrids are often overlooked in the field and our knowledge of the distribution of most hybrid taxa is incomplete. In recent years work has commenced towards a *Hybrid Flora of the British Isles*. We have taken the decision to exclude all hybrids from this *England Red List* until after the *Hybrid Flora* has been published. In this way, we shall be able to assess threat based on a comprehensive data set. It is likely that this information will be available by 2015.



Melampyrum arvense, a species now included in the Main List following a revision of its archaeophyte/neophyte status in England. (Peter Stroh).

2.5 Geographic coverage



Figure 1: The England Red List covers the country (region) of England that includes the following 57 vice-counties (VC number in brackets): West Cornwall & Isles of Scilly (1), East Cornwall (2), South Devon (3), North Devon (4), South Somerset (5), North Somerset (6), North Wiltshire (7), South Wiltshire (8), Dorset (9), Isle of Wight (10), South Hampshire (11), North Hampshire (12), West Sussex (13), East Sussex (14), East Kent (15), West Kent (16), Surrey (17), South Essex (18), North Essex (19), Hertfordshire (20), Middlesex (21), Berkshire (22), Oxfordshire (23), Buckinghamshire (24), East Suffolk (25), West Suffolk (26), East Norfolk (27), West Norfolk (28), Cambridgeshire (29), Bedfordshire (30), Huntingdonshire (31), Northamptonshire (32), East Gloucestershire (33), West Gloucestershire (34), Herefordshire (36), Worcestershire (37), Warwickshire (38), Staffordshire (39), Shropshire (Salop) (40), South Lincolnshire (53), North Lincolnshire (54), Leicestershire (55), Nottinghamshire (56), Derbyshire (57), Cheshire (58), South Lancashire (59), West Lancashire (60), South-East Yorkshire (61), North-East Yorkshire (62), South-West Yorkshire (63), Mid-West Yorkshire (64), North-West Yorkshire (65), County Durham (66), South Northumberland (67), North Northumberland (68), Westmorland (69), and Cumberland (70).

3 Data sources

Like the GB and Wales Red Lists, data used for the *England Red List* came from the Vascular Plant Database (VPDb) held by the Biological Records Centre (BRC) at CEH Wallingford. The VPDb enabled comparison of spatial and temporal data collected for the two Atlases (Perring & Walters 1962; Preston *et al.* 2002). The GB and Wales Red Lists used hectad data collated from the 1930-1969 and 1987-1999 recording periods or 'date classes' to calculate the trend in distribution (Area of Occupancy or AOO) and spatial spread (Extent of Occurrence or EOO) for each taxon (see Sections 4.6 and 4.7 for a detailed explanation of AOO and EOO). This % trend figure was then used to determine threat status under Criterion A of the IUCN Red List Criteria (see Table 1 in Section 4.3 and also Section 7). For the *England Red List* it was originally intended to make use of post-*New Atlas* data so that a third date class (2000+) could be included in AOO and EOO analyses. However, despite several attempts (see Section 4.6) it was not possible to use these data. Consequently, the *England Red List* used the same date classes as the GB and Wales Red Lists to analyse population trends for Criterion A.

Assessments of threat using IUCN Criteria B, C and D (see Section 4.3) utilise more recent (post-*New Atlas*) information on the number of locations and/or size of population in England which (in the case of Criteria B and C) involve having to determine whether taxa are undergoing a continuing decline. For most taxa in England population size and/or the number of locations exceed the maximum thresholds for a taxon to be considered as threatened under any of these Criteria (see Table 1). However, recent information required for Criteria B, C and D was collated for 162 species occurring in 15 hectads or less in England. Records came from a wide variety

of sources, including correspondence with BSBI Vice-County Recorders (VCRs), BSBI referees and other experts, draft or published County Rare Plant Registers http://www.bsbi.org.uk/rare_plants.html, recent county Floras, verified records held on the BSBI Distribution Database (DDb), peer-reviewed and grey literature, and responses to requests for information sent out to amateur botanists, NGOs, the Broads Authority, Local Records Centres, the Environment Agency and Natural England. In addition, a limited number of data were collected in the field by the authors when no other recent information could be found. Even so, there are still a few taxa that require further surveys before an accurate threat status can be assigned, and where this is the case a comment is made in the appropriate column on the Main List (Section 8).

The general approach adopted for the *England Red List* therefore mirrors the GB and Wales Red Lists, with the most up-to-date information available being used to assess threat under IUCN criteria B, C and D, and hectad data for the date classes 1930-1969 and 1987-1999 to assess threat under IUCN Criterion A.



The most recent information was gathered for a number of species that occur in 15 hectads or less, including Hypochaeris maculata (Peter Stroh).

4 Application of IUCN Criteria

4.1 IUCN categories at the regional level

The standard IUCN Red List Categories (IUCN 2001) have been applied (Figure 2) with the following modifications to take account of the regional nature of this analysis:

1 Taxa which are extinct within the region but extant in other parts of the world are assessed as 'Regionally Extinct' (**RE**). A taxon is considered to be **RE** when '*there is no reasonable doubt that the last individual has died*' (IUCN 2003). In this report, taxa extinct in England but still

present elsewhere in GB are assessed as **RE**, whereas taxa extinct in GB as a whole are classified as Extinct (**EX**). Consequently, the *England Red List* includes both **RE** and **EX** taxa.

2 Taxa that are (or have been) present in England but are not considered eligible for assessment at regional level are assigned the category 'Not Assessed' (**NA**) and are separately listed in Section 9. These are taxa that are native to other parts of GB but are considered to be either neophyte or casual in England.

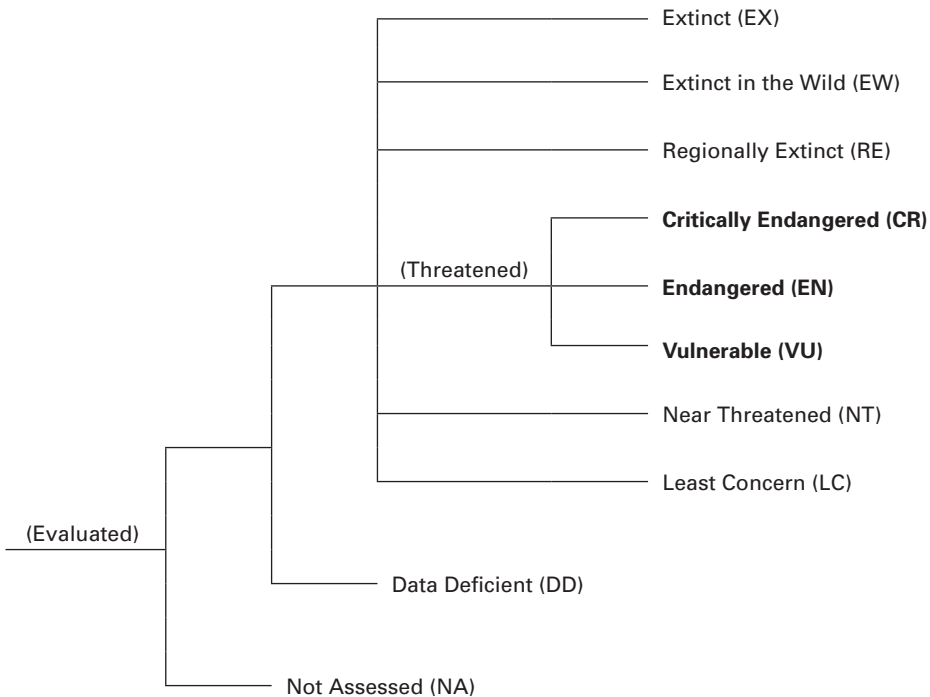


Figure 2: The structure of IUCN categories at the Regional level (taken from IUCN 2003).

4.2 Treating England as a region

A region is defined by the IUCN (2003) as any sub-global geographically defined area, such as a continent, country, state or province. Although the standard IUCN categories and criteria are applicable at regional level, if a region shares a geopolitical border, as England does with both Wales and Scotland, then the potential for movement of propagules to or from other populations beyond that border has to be taken into account when assigning a final threat status. This is because the unit being assessed only supports a proportion of the whole, and so there is the possibility that the estimate of extinction risk may be exaggerated.

The *Wales Red List* assessed the likelihood of a Welsh population experiencing any significant immigration of viable propagules from England by using a dynamism score (Pocock *et al.* 2006), with a score of 5 denoting the most dynamic species (e.g. *Catabrosa aquatica*) and a score of 1 representing species that are highly sedentary (e.g. *Carex panicea*). As Dines (2008) notes, if interpreted with care, dynamism can indicate which taxa are more likely to immigrate under suitable conditions.

For the *England Red List*, in situations where the entire range of a taxon is located near to the borders of either Scotland or Wales and has a high dynamism score, a threat status may be downgraded by one category if the GB population is assessed as **LC**. If the GB population is threatened or **NT**, then the English IUCN threat category remains unaltered (following Dines 2008).

4.3 IUCN categories in England

Apart from the modifications outlined in Sections 4.1 and 4.2, thresholds used for the *England Red List* are the same as those

used for the *GB Red List*. Table 1 gives a brief description of the IUCN categories and the four Criteria (A-D). A fifth Criterion (E: Quantitative Analysis of Extinction Risk) was not considered for the *GB Red List* because there were no published population viability analyses, and for the same reasons Criterion E has not been used for the *England Red List*. The **NT** category was applied to taxa that did not qualify as threatened (i.e. **CR**, **EN** or **VU**) but were close to qualifying against one or more of the thresholds summarised in Table 1; thresholds for **NT** were the same as those used in the *GB Red List* (Cheffings & Farrell 2005, p.17).

Taxa not qualifying as threatened or **NT** under any of the Criteria in Table 1 are included in the *England Red List* as either Extinct (**EX**), Regionally Extinct (**RE**), Extinct in the Wild (**EW**), Data Deficient (**DD**) or of 'Least Concern' (**LC**) (see Table 2 for definitions). If a taxon is listed as being **LC**, it is important to emphasise that this does not imply that it is of *no conservation concern*, but rather that, in terms of *extinction risk*, it is not threatened. A taxon may require conservation action even if it is not listed as threatened, just as a threatened taxon that has been effectively conserved may, as its status improves over time, be eventually re-assessed as **LC**.

Examples of the process followed to arrive at a threat status for ten *England Red List* taxa can be found in Section 7.

Table 1: IUCN threat categories and Criteria applied to the England Red List. Some IUCN sub-criteria were not used in the assessment process. Criterion A evaluates distribution trends (Area of Occupancy – AOO) and/or spatial spread (Extent of Occurrence – EOO) since 1930; Criterion B deals with declining taxa that have a restricted geographic range and occur in a small number of locations; Criterion C covers declining taxa that have a small population size; Criterion D assesses taxa that are not necessarily declining, but have a very small number of individuals and/or occur at a small number of locations. If a taxon qualifies for more than one threat category, the highest threat category is assigned.

	Critically Endangered	Endangered	Vulnerable	Near Threatened
A. Population reduction	≥ 80%	≥ 50%	≥ 30%	≥ 20%
Sub-criteria A2: Population reduction observed, estimated, inferred, or suspected in the past where the causes of reduction may not have ceased or may not be understood or may not be reversible, based on sub-criteria (a) or (c)				
	(a) direct observation			
	(c) a decline in area of occupancy (AOO), extent of occurrence (EOO) and/or habitat quality			
B. Geographic range				
Sub-criterion B1: EOO	<100km ²	<5,000km ²	<20,000km ²	
Sub-criterion B2: AOO	<10km ²	<500km ²	<2,000 km ²	
AND				
(a) Number of locations	1	≤5	≤10	≤30
(b) Continuing decline in any of: (i) EOO; (ii) AOO; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals.				
C. Small population size and decline				
Number of mature individuals	<250	<2,500	<10,000	not applicable
AND				
Sub-criterion C2: A continuing decline AND				
C2 (ai) Number of mature individuals in each subpopulation:	<50	<250	<1,000	not applicable
or				
C2 (aii) % individuals in one subpopulation =	90-100%	95-100%	100%	not applicable
D. Very small or restricted population				
Either:				
Number of mature individuals	<50	<250	D1. <1,000	<10,000
			AND/OR	
VU D2. Restricted number of locations with a plausible future threat that could drive the taxon to CR or EX in a very short time			D2. number of locations ≤5	

Table 2: Explanation of IUCN threat categories applied to taxa that are not assessed as threatened (i.e. CR, EN, VU) or Near Threatened (NT).

Threat Category	Description
Least Concern (LC)	Assessed as not threatened following consideration of Criteria A, B, C & D
Extinct (EX)	Extinct in England and elsewhere in GB
Regionally Extinct (RE)	Extinct in England but still present elsewhere in GB
Extinct in the Wild (EW)	Extinct in England and elsewhere in GB, but still present in cultivation
Data Deficient (DD)	Taxa believed to have very restricted and quite possibly threatened populations, but insufficient data for analysis
Waiting List (WL)	Full assessment not possible due to inadequate data, taxonomic uncertainties or uncertainties over native or archaeophyte status

4.4 Defining a population, individual and location

A population is defined by the IUCN as ‘the total number of individuals of the taxon throughout its distributional range’ (IUCN 2013). For the present exercise the distributional range is England, so individuals found in the rest of the GB or global range are not considered. In instances where population size fluctuates markedly from year to year (e.g. *Arenaria norvegica* subsp. *anglica*, *Juncus capitatus*, *Rumex rupestris*, *Trifolium bocconei*), a lower estimate that may be much less than the mean is used to determine population size in accordance with IUCN guidelines. Within each population there will usually be multiple subpopulations, defined as ‘geographically or otherwise distinct groups in the population’ (IUCN 2013). For example, in England *Orchis simia* has an estimated population of 370 mature individuals comprising two subpopulations of 345 individuals and 25 individuals. Knowledge of the number of individuals present within each subpopulation can help to identify risks associated with fragmentation, and this information can influence the level of threat assigned to a taxon under Criteria C2ai and C2aii (see Table 1).

When estimating the total number of

individuals in a population, defining ‘an individual’ is often difficult, with different methods used depending on the life-form of the taxon being recorded. For orchids the number of flowering spikes is often used as a proxy count for the number of individuals despite studies showing that this can underestimate population size for some species (e.g. Wells *et al.* 1998; Hutchings 2010). For species such as *Phleum alpinum* or *Blysmus compressus* individuals can be virtually impossible to distinguish in the field; in these circumstances an estimate of ‘extent’ (e.g. square-metre coverage) or numbers of ‘patches’ or ‘clumps’ may be employed alongside an estimate of the number of flowering/fruitlet stems. It is accepted that the use of different methods in assessing a population size can make interpretation difficult, but in every case the thresholds have been applied to the available data in as rigorous and consistent a manner as possible.

The number of locations, particularly for rarer species, influences the final threat category and it is important to be aware that a ‘location’ is not the same as a botanical ‘site’. The IUCN Guidelines (IUCN 2013) state that a location is ‘a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the taxon present’; and that in addition, ‘the size of the



Blysmus compressus, a rhizomatous species that can form 'swards' of shoots making it impossible to establish the number of individuals in a subpopulation (Simon Leach).

location depends on the area covered by the threatening event'. Where practical we have followed the *GB Red List* approach of defining locations as 'management units', on the assumption that a land-use change generally imposed at the management unit level (e.g. ploughing, burning, tree-felling, cessation of grazing) will usually constitute the most likely potentially threatening event. For aquatic plants, whole drainage systems are considered as single locations, as either diffuse or point-source pollution in one part of the catchment could impact on the entire system. Difficulties occasionally arise when attempting to define locations for taxa with a scattered distribution across large, open tracts of land. In such instances, the *GB Red List* sometimes used the number of occupied tetrads (2 x 2km squares) as a proxy for estimating the number of locations (Cheffings & Farrell 2005, p.16).

However, this approach does have its own problems, not least that it may produce spurious multiple records for single locations when these straddle tetrad boundaries. We have followed the *GB Red List* approach as closely as possible, but decided to replace a 'fixed' tetrad proxy with a 'movable' or 'floating' tetrad in such instances. Sometimes this approach was redundant as a plant's lack of mobility and habitat restriction guided the decision. For example, two subpopulations of *Saxifraga hirculus* within a large expanse of otherwise unsuitable habitat would count as two locations, even if they were present within the same movable tetrad, by virtue of their physical isolation and the fact that suitable habitat patches for this species tend to be highly restricted, non-contiguous and 'immobile'.

4.5 Conservation introductions

Guidance produced by the IUCN (2013) recommends that a conservation introduction should only be included in an assessment of threat if it meets all the following criteria:

1) it lies within the known native range of the target species, 2) it used suitable genetic stock, 3) it is more than five years old, and 4) there is evidence of sustained production of viable offspring, i.e. the introduction is '*self-sustaining*'.

The first two criteria relating to biogeography and genetics were accepted as appropriate and 'workable', but we felt that five years was a rather arbitrary (and often too short) time period for determining the success or failure of an introduction and so have excluded this criterion. Regarding the criterion of 'self-sustainability', we have included a conservation introduction when there is evidence of viable offspring being produced over a suitable period of time relative to the known ecology of the introduced taxon (i.e. the introduction has become *ecologically self-sustaining*) and if the introduction lies within a well-protected site (e.g. a SSSI or second tier site). This last point is founded on the assumption that, to stand much chance of remaining viable in the long term, an introduced population will invariably require the added 'security' of occurring on a suitably protected site. In addition, conservation introductions were only considered for native (not archaeophyte) taxa that were assessed in the *GB Red List* as **CR** or **EN**, or if they were included on Schedule 8 of the Wildlife and Countryside Act 1981.

In the very small number of cases where ecologically self-sustaining introductions were included in the analysis (e.g. the introduced subpopulation of *Senecio paludosus* at Woodwalton Fen National Nature Reserve (NNR), Huntingdonshire), the final threat

assessment is based on both extant native and introduced material. Where appropriate the comments column in the Main List includes details of the introduction, including the start date, number of locations and the current number of mature individuals when known. Where possible, details of introductions of threatened taxa that do not yet meet the criteria noted above, but that may become ecologically self-sustaining in the future, are listed in the comments column.



Senecio paludosus at Woodwalton Fen NNR – an example of an ecologically self-sustaining introduction (Peter Stroh).

Conservation introductions that take place outside the native range of a plant are termed 'benign introductions' and may be considered only if they are established within an appropriate habitat and eco-geographical area, and when there is no suitable habitat

left within the historic range of a taxon (IUCN 1998). If the only individuals left in England are in a population resulting from a benign introduction, then the taxon is considered **EW**. These criteria resulted in the exclusion of a number of experimental introductions of taxa that continue to persist but are either located beyond the limits of a (presumed) natural range e.g. *Geranium sanguineum*, *Koeleria vallesiana*, *Veronica spicata* and other rare taxa of the Mendip limestone or Avon Gorge planted at the Goblin Coombe experimental site in Somerset (Hope-Simpson *et al.* 1955).

In a few cases, introductions fail to meet both 'conservation' and 'benign' criteria. For example, in the 1950s species-rich turves were transplanted from the Lake District and the Scottish Highlands to exclosures on Moor House NNR (now part of Moor House-Upper Teesdale NNR), Westmorland. The trial introductions aimed to recreate a

vegetation type that was hypothesised to have occurred in the distant past, and to answer questions about the effects of sheep grazing on rare upland species with restricted ranges (Park *et al.* 1962). Several introduced taxa were either newly recorded to the area but present elsewhere in England (e.g. *Alchemilla alpina*, *Cerastium alpinum*, *Cornus suecica*, *Oxyria digyna*, *Poa glauca*, *Salix herbacea*, *S. lapponum*, *Saussurea alpina*, *Silene acaulis*, *Saxifraga nivalis*) or new to England entirely (e.g. *Gnaphalium supinum*, *Juncus trifidus*, *Minuartia sedoides*, *Salix reticulata*, *Salix arbuscula* and *Sibbaldia procumbens*) with some surviving to the present day. All are considered to be outside their known natural range and therefore cannot be considered for assessment.

Regrettably, such field experiments can also cast doubt on the status of taxa that may be native to the area. For example, the highest British population of *Circaea alpina* occurs in



Circaea alpina (Mark Gurney).

one of the experimental closures on Moor House. The species is not listed as a deliberate introduction, but the plants grow in atypical habitat. Propagules or plants are unlikely to have been present in the Lake District area from where the turves were originally taken, and so the possibility exists that the species was present but previously overlooked in the enclosure area prior to the experimental introduction, or perhaps may have established more recently via natural dispersal mechanisms. Equally, seeds may have arrived accidentally, for instance in the soil of translocated turves. Altitudinal limits can tell us a great deal about ecological tolerance to conditions that limit growth, such as air and soil temperature during the growing season, but some suspicion is inevitably attached to the *C. alpina* record because it is associated with an experimental introduction.

Although there have been attempts to document introductions in the past there is at present no definitive record of plant introductions for species of conservation concern in either England or GB as a whole. This can make interpretation of trends in population and distribution challenging for some threatened taxa, but we have made every effort to collate all available data for all relevant introductions and then assess whether they qualify using the guidelines noted above. In addition, when extant native populations or subpopulations are 'bolstered' or 'reinforced' with introduced stock it can be impossible to know if individuals still present are originals or 'reinforcements' (e.g. *Thalictrum alpinum* on Knock Fell or *Potentilla crantzii* at Rough Sike, both in the northern Pennines). In the small number of cases where there is published evidence that populations have been bolstered, we have determined a threat status on a case-by-case basis based on all available information, and have included our reasoning in the text.

4.6 Methods used for assessing Area of Occupancy (AOO)

Area of Occupancy (AOO) is defined as the area occupied by a taxon within its overall 'range' (see Section 4.7), excluding cases of vagrancy (IUCN 2013), and is determined by the 'scale' at which the presence of taxa is recorded. In recent years it has become commonplace to record plants to at least tetrad resolution, and the tetrad is recommended as an appropriate-sized unit for measuring AOO by the IUCN. However, records for the 1930-1969 period were invariably made at hectad scale, as were the majority of records for the 1987-1999 period; consequently, the calculation of AOO for taxa in the *England Red List* uses hectad resolution data. The *GB Red List* calculated AOO at tetrad scale for these two date classes by extrapolating the number of tetrads from the number of hectad records using a scale-correction factor published by the IUCN (2001). The extrapolated results were then checked against two independent sets of 'real' tetrad data that covered part of the 1987-1999 recording period. Following this scale correction, the percentage change between these two recording periods provided the AOO result for each taxon. However, because of a lack of information for many taxa, this method of scaling down the data from hectad to tetrad resolution could not factor in qualitative information about the biology of a taxon (e.g. habitat specificity; dispersal ability) recommended by the IUCN guidance. In addition, this method of assessing AOO did not account for differences in recorder effort between the two date classes, nor was it capable of calculating a significance value for trends.

There are a number of spatial and temporal biases inherent in all biological datasets. For example, some areas are recorded more intensively because of their accessibility,

the expertise of the recorders and/or the number of volunteers available. These biases may change through time and therefore analysing trends for a given species is not straightforward (Prendergast *et al.* 1993; Hassall & Thompson 2010). In recent years, however, statistical methods have been developed to account for spatial and temporal variation in recording effort, thereby making the results of trend analyses more robust, and the *England Red List* was able to use one such method.

FRESCALO (FREquency SCALing LOcal) (Hill 2012) corrects for variation in recording intensity geographically and over time. FRESCALO uses the idea of ‘neighbourhoods’ – floristically similar hectads surrounding a target location. Each hectad in England has its own ‘neighbourhood’. To account for spatial variation in recording effort, FRESCALO makes the simple assumption that if each neighbourhood was searched thoroughly, the mean species frequency would be similar across all neighbourhoods. By calculating the deviation of each neighbourhood from this expected value (accounting for species richness) it is possible to estimate recorder effort (Figure 3).

There are two main limitations to this approach. Firstly, it makes an assumption about the value of the mean frequency, assuming it to be constant across space. This means that in neighbourhoods where the mean frequency is genuinely lower than our assumed value, FRESCALO will overestimate species occurrence, and vice versa. Secondly, it infers recorder effort in a hectad from values in its ‘neighbourhood’; this has the effect of smoothing the estimates of recorder effort (Figure 3). As a consequence, fine-scale variation in recording effort (e.g. a poorly recorded target hectad in a neighbourhood of well recorded hectads) will be missed and may result in inaccurate estimates of recorder

effort in the target hectad. These limitations are unlikely to significantly impact on estimates of *trends*, since estimates of spatial variation in recorder effort are constant over time, but they may have some impact on our estimates of species *distributions* (see Figure 4).

FRESCALO accounts for variation in recording effort over time by considering the commonest species (termed ‘benchmark’ species) recorded in each neighbourhood. FRESCALO does this by first pooling the list of species records for each neighbourhood and then ranking them by their frequency across all time periods (in this case the two date classes 1930-1969 and 1987-1999). Species in the top 15% in a neighbourhood

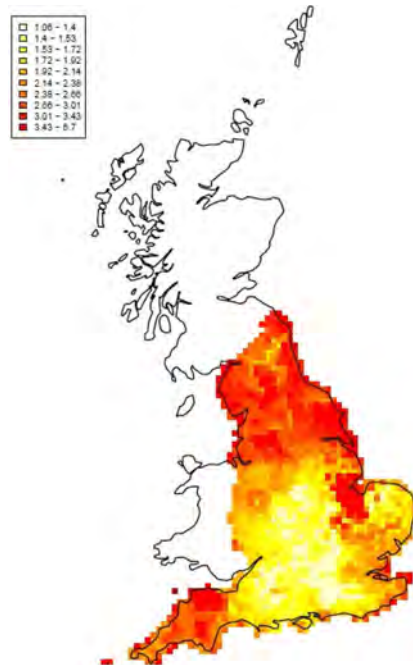


Figure 3: A map of the distribution of recording intensity across England, as estimated by FRESCALO, amalgamated for both Atlas time periods (1930-1969 and 1987-1999). Low alpha values (white) indicate areas of low under-recording, and high alpha values (red) indicate areas of high under-recording.

were considered to be suitable benchmarks to use in the AOO analysis for this Red List. The change in a species' occurrence was then calculated relative to these benchmarks. Since the benchmark species are common and assumed to be stable, any change in their frequency is considered likely to be the result of changes in recording effort over time. To avoid selecting species as benchmarks that invalidated our assumption of stability, a list was drawn up of common species known to have changed in their levels of occurrence over time, and these were not used as benchmarks in the analysis.

Once spatial and temporal variations in recorder effort had been calculated, FRESALCO then worked out the trend in distribution between the two time periods by first giving each species a value, known as a Time factor, or 'Tfactor'. This 'Tfactor' measures the relative probability of finding the target species on a typical visit relative to the benchmark species, with decisions on change dependant on the ratio of Tfactor values. Tfactors were calculated for both time periods, and a z-test was performed for each species to test if the two time periods were significantly different from one another. This test also calculated the probability that the trend could have resulted by chance. When the probability was 5% or less, the trend between the two time periods was considered unlikely to have resulted by chance and was included as a statistically significant trend (see Figure 4). Where the result was significant the percentage change in recording rate relative to benchmarks (Tfactor) was calculated and used to assign a Red List status. This percentage-change figure is shown for each taxon assessed as threatened under Criterion A in the Main List (Section 8).

It was initially hoped that the FRESALCO method would enable the *England Red List* to incorporate four date classes in the analysis,

i.e. 1930-1969, 1970-1986, 1987-1999, and 2000+. However, the incompleteness of the most recent date class led to a number of spurious results. Furthermore, inclusion of four date classes meant that a regression was required rather than a z-test. The more data points (i.e. date classes) included in a regression analysis, the better it can detect a trend where one exists. Having only four data points gives a very low power in the regression and we had little confidence in the draft results produced by this approach. Consequently, a FRESALCO comparison using the two Atlas date classes and a z-test was undertaken to ensure that best quality data were used in the analyses and that the results calculated were as robust as possible.

4.7 Methods used for assessing Extent of Occurrence (EOO)

Extent of Occurrence (EOO) is defined as the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all extant locations of a taxon (IUCN 2001). EOO is commonly referred to as a measure of *range*, although strictly speaking EOO measures the *geographical spread* of areas currently occupied by the taxon. A taxon with a large EOO is usually less likely to be adversely affected by a single threatening event than a taxon with a smaller EOO because the risk is spread more widely (IUCN 2013). However, calculating EOO is not simply a case of 'joining the dots' and calculating the area within the drawn boundary, and arriving at an EOO can be particularly problematic in cases where a taxon has a highly disjunct or coastal distribution.

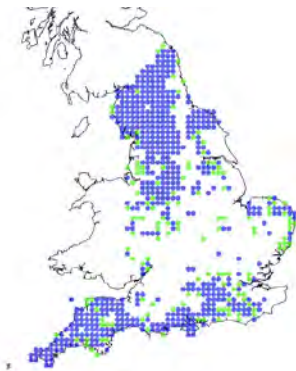
There are several different methods available for measuring EOO, and four were tested on the data for this Red List. The first method ('Number of Squares') is the simplest of the techniques and involves determining the number of grid squares in which the

species has been recorded. These values are converted to an area by multiplying the number of squares by the square area. The second method – the Minimum Convex Hull (MCH) – draws the smallest single polygon that contains all of the data points (occupied hectads) and intersects with the outline of England to calculate an area that excludes the sea, Scotland and Wales (Figure 5).

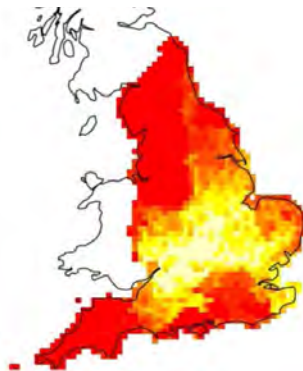
The third method – Localised Convex Hull (LoCoH) (Getz & Wilmers 2004; Getz *et al.* 2007) – is an extension of MCH but rather than fitting one polygon to the dataset for each species it fits a series of localised polygons and aggregates these to construct the final ‘hull’ (Figure 5). Finally, the fourth method (Alpha Hull) is also a generalisation of the convex hull method but has been

***Erica tetralix* (Near Threatened)**

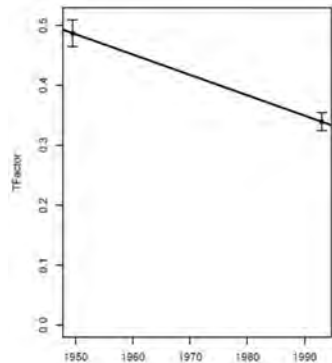
Actual distribution



Adjusted frequency



Temporal trend

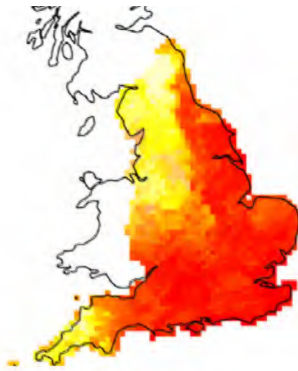


***Anacamptis morio* (Vulnerable)**

Actual distribution



Adjusted frequency



Temporal trend

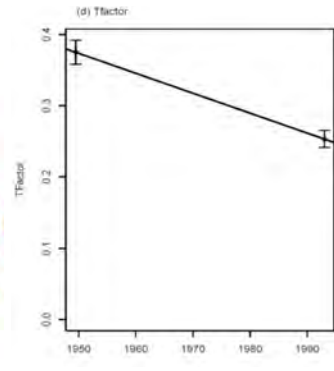


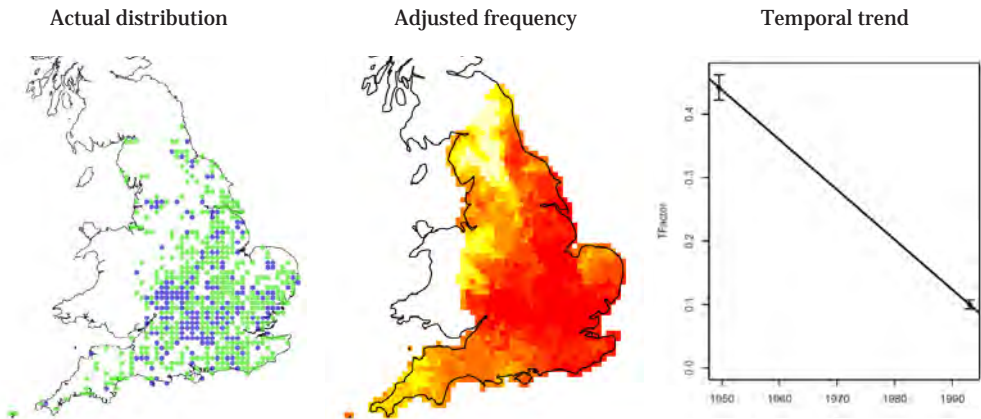
Figure 4: Four examples of FRESALO output. The maps on the left display the recorded hectad distribution combined for both Atlas time periods (green dots = 1930-69; blue dots = 1987-99). The map in the centre displays the ‘frequency’ values for each of the four example species after accounting for spatial variation in recorder effort. This measure gives the probability that the species occurs in a hectad in either time period. Red indicates a very high probability that the species is present while

suggested as being more suitable to species distributions than MCH, especially when dealing with irregularly shaped species ranges (Burgman & Fox 2003). The Alpha Hull method (Figure 6) works by joining all points so that no lines intersect between points (i.e. making a Delaunay triangulation of the data points), then selectively removing lines from this triangulation based on the value of a

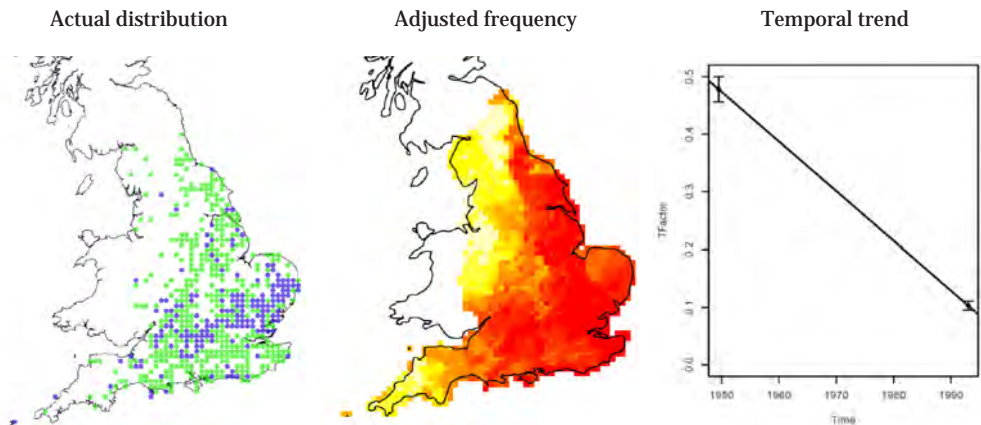
parameter α . The smaller the value of α , the finer the resolution of the hull produced. For this analysis and following expert opinion, we applied the same α value of 20000 used for the *GB Red List* across all species.

After performing analyses and inspecting the results using all four methods, we decided to use the Alpha Hull method for calculating

Ranunculus arvensis (Endangered)



Scandix pecten-veneris (Critically Endangered)



white indicates a very low probability of occurrence. Since these data are based on inferences made from neighbourhood information, the probability maps appear smoothed and do not pick up finer scale change in occurrence. Graphs on the right show the Tfactor for each species in each of the two time periods. This measure accounts for temporal bias in recorder effort and allows us to perform a statistical test to test for significance. A significant negative trend was calculated for each of the example species.

EOO trend between the two date classes.
This method is recommended by the IUCN
and was used for the *GB Red List*, and direct

comparisons can therefore be made between
GB and England EOO trends.

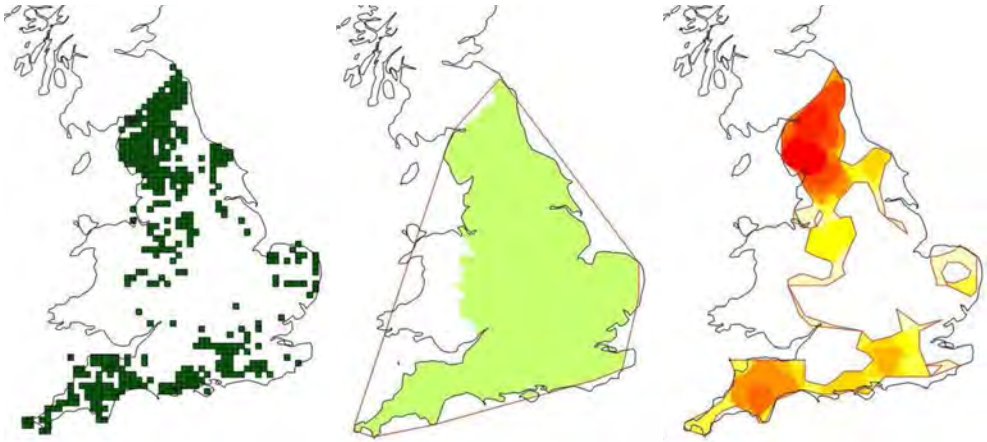


Figure 5: Measuring the Extent of Occurrence (EOO) of *Drosera rotundifolia* for the first Atlas recording period (1930-1969). The 'dot map' on the left shows recorded hectad distribution for the period, the centre map shows the EOO polygon created using the Minimum Convex Hull (MCH) method, the map on the right shows the EOO produced by the Localised Convex Hull (LoCoH) method.

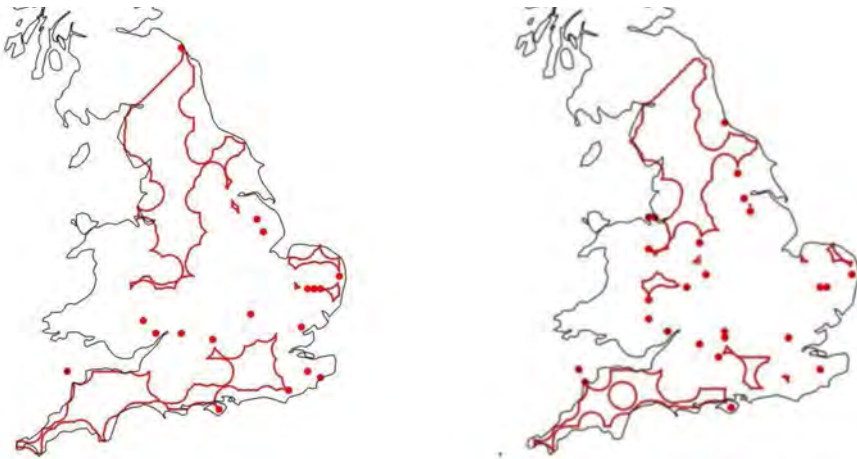


Figure 6: The EOO polygon created for *Drosera rotundifolia* for both Atlas recording periods (1930-1969 left; 1987-1999 right) using the Alpha Hull method. Note the subtle differences between the two maps, particularly in south-west, southern and eastern areas of England, reflecting the loss of this species in these areas since the first Atlas period.

5 Explanation of the England Red List

The columns that appear in the Main List (Section 8) of this Red List are explained below.

5.1 Species information

As stated in Section 2.1, species names (as given in the **Taxon** column) follow Stace (2010). Where nomenclature differs from the published *GB Red List*, the original name is presented in parentheses next to the current name e.g. *Avenula pratensis* (*Helictotrichon pratense*). Only native and archaeophyte taxa are included in the *England Red List* (see Section 2.1 for definitions and exceptions). Native taxa are left blank in the **Native/Archaeophyte** column; Archaeophytes are denoted as 'Arch'.

The **GB Red List status** column lists the threat category of each taxon as given in Cheffings & Farrell (2005) or in subsequent amendments (Leach 2007, 2010; Leach & Walker 2011, 2013). The threat category for England is given in the column titled **England Red List status** (see Section 5.4).

5.2 National responsibility and European edge of range

An assessment has been made of the proportion of the GB distribution of each taxon found within England. This is based on the number of hectads for which there are modern (i.e. post-1986) records and follows the method used for the *Wales Red List*. If England holds 75% or more of the GB distribution it is deemed to have a *national responsibility* for the taxon. The percentage estimate for England is given in the **Proportion (%) of GB hectads in England** column. The percentage estimates for taxa with 10% or less of their

GB distribution in England are also included in this column. Although England does not have a national responsibility for these taxa, it was thought useful to highlight them in the Main List for ease of reference as many are of interest from a biogeographic perspective (e.g. they may be at their southern or eastern GB range limits).

We decided not to include detail on all taxa reaching the edges of their GB range in England as this list would include a large number that reach their southern limits in England simply because they are present 'below Wales'. However, information is included from Preston (2007) for all taxa that occur at their absolute northern or southern European range limits in England in the **European edge of range?** column.

European range limits for England are separated into three latitudinal bands: 45°N to 50°N, 50°N to 55°N, and 55°N to 60°N (Figure 7; Table 3), although as can be seen from Figure 7 the vast majority of England falls within the 50°N to 55°N band. As range limits in Preston (2007) did not discriminate between GB regions, the distribution of these European edge of range taxa were cross-checked against *New Atlas* maps in order to exclude those for which northern or southern range limits are located in Scotland, Wales, Isle of Man, Channel Islands, Northern Ireland or Republic of Ireland.

5.3 International responsibility

The *GB Red List* attempted to estimate whether the UK held a significant (i.e. >25%) proportion of the European population for each species (excluding subspecies) by first estimating the European range and then estimating the proportion of that range

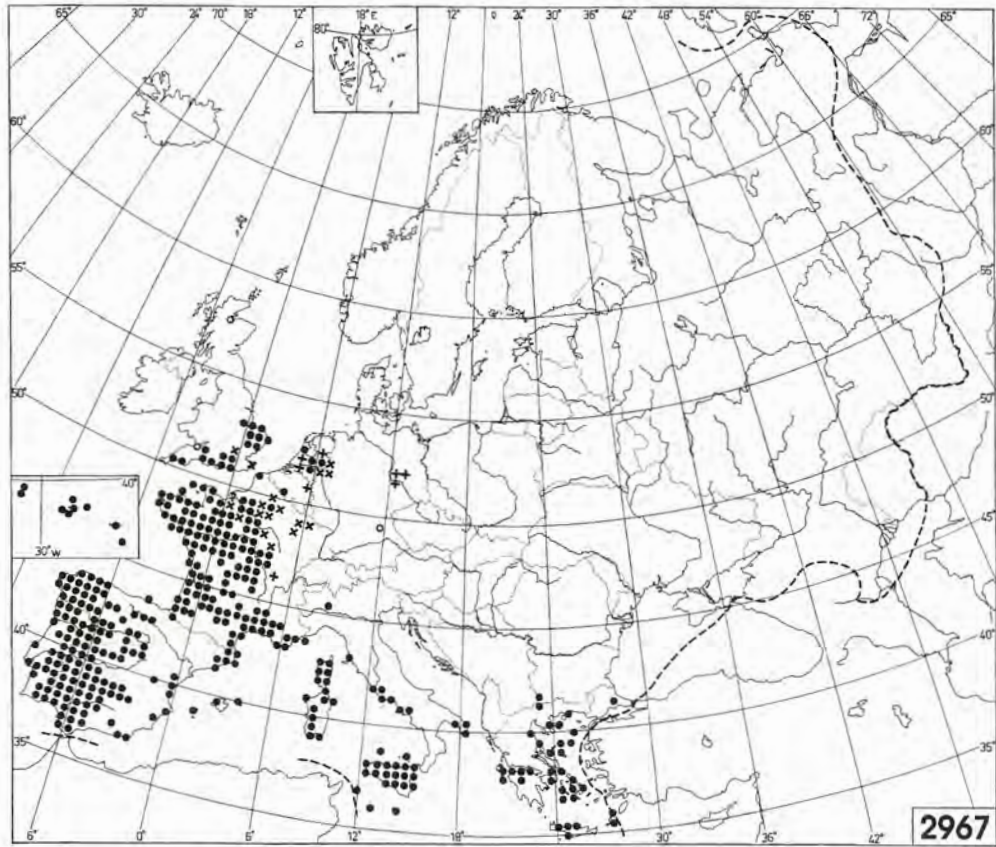


Figure 7: The distribution of *Crassula tillaea* in Europe (taken from Jalas et al. 1999), showing the three latitudinal bands that encompass England (45°N to 50°N, 50°N to 55°N, and 55°N to 60°N), with the native northern European range limit for *C. tillaea* at Gibraltar Point, North Lincolnshire.

Table 3: European range limits for England for three latitudinal bands: 45°N to 50°N, 50°N to 55°N, and 55°N to 60°N. The coding (e.g. N_1 , S_1) differentiates between absolute northern and southern range limits within latitudinal bands and is used in the column entitled **European edge of range?** in the Main List.

European Edge of Range Code	Explanation of European Edge of Range Code
N_1	absolute northern European limit between latitudinal band 45°N and 50°N
N_2	absolute northern European limit between latitudinal band 50°N and 55°N
N_3	absolute northern European limit between latitudinal band 55°N and 60°N
S_1	absolute southern European limit between latitudinal band 45°N and 50°N
S_2	absolute southern European limit between latitudinal band 50°N and 55°N
S_3	absolute southern European limit between latitudinal band 55°N and 60°N

lying within the UK (see Cheffings & Farrell 2005, pp.22-23). We have attempted the same exercise for the *England Red List* by comparing the English distribution with the UK distribution and amending the *GB Red List* 'International responsibility' status for England accordingly. The initial conclusions are annotated in the **International responsibility** column in the Main List as follows:

- Yes* We are sure that England holds more than 25% of the European population.
- Probably* We are fairly sure that England holds more than 25% of the European population.
- Possibly* There is a reasonable chance that England holds more than 25% of the European population.

5.4 England endemics and near endemics

For the purposes of this Red List, an endemic taxon is defined as one for which the entire native global range lies within England. Taxa that qualify are listed as 'yes' in the column entitled **England endemic?**. If the entire native global range lies within the 'British Isles', i.e. within the United Kingdom, Republic of Ireland, Channel Islands and the Isle of Man, then it is listed as 'yes' in the **England near endemic?** column.

5.5 England Red List categories and criteria

If a taxon is assessed as threatened under IUCN Criteria A, B, C or D, an IUCN threat category (**CR**, **EN** or **VU**) is given in the **England Red List status** column. If a

taxon is assessed as being Near Threatened (**NT**) or of Least Concern (**LC**), the cell in the *England Red List* status column is annotated **NT** or **LC** respectively. The qualifying Criteria for each threatened or **NT** species is explained in the adjacent **Threat Criteria** column. When a threatened or **NT** status is linked to a decline in AOO or EOO under Criterion A, the percentage decline is listed in the **% AOO decline** or **% EOO decline** columns respectively. All declines have a confidence value of 95% or higher unless otherwise stated in the **Comments** column. Further information on how a threat status is determined can be found in Cheffings & Farrell (2005; pp.18-22) and examples of the process used to determine threat for selected taxa assessed in this Red List are given in Section 7. Information on how the **Number of locations** and **Number of individuals** columns were populated is given in Section 4.4.

5.6 Modification of England Red List categories

IUCN threat categories can be modified if there is high probability of inward migration of a threatened taxon by means of propagules originating beyond a region's geopolitical borders (see Section 4.3). As assessment was performed for all threatened taxa in England on the basis of the criteria summarised in Section 4.3, but in no instance did the results indicate any need to change the threat status given.

6 Results and discussion

6.1 Comparison of England, Wales and GB Red Lists

19.9% of all native and archaeophyte taxa assessed in England were considered threatened (i.e. **CR**, **EN** or **VU**) (Table 4). This compares with 15.9% of all taxa assessed in Wales and 21.0% in GB (updated from Cheffings & Farrell 2005).

Comparisons between England, GB and the proportion of threatened species in each area are not straightforward. This is because the larger area (GB) includes the smaller area (England), but the smaller area is not a random sample of the larger area. This is not the case with England and Wales, and so more confidence can be placed in a comparison between these two 'regions'.

There are proportionately more **EX**, **RE** and **CR** species in Wales than England (Table 4).

As Wales is approximately one sixth the size of England (20,779 square kilometres in Wales compared with 130,357 square kilometres in England), a greater proportion of **RE** and **CR** species is to be expected because of the scale-dependency of extinction i.e. smaller areas will tend to lose more species than larger areas due to the habitat for a taxon being more restricted. Of the 29 species assessed as **RE** in Wales, for example, only three species are also **RE** in England (*Melampyrum sylvaticum*, *Mertensia maritima*, *Potamogeton filiformis*), whereas 13 species are **CR**, **EN** or **VU** in England (*Adonis annua*, *Campanula rapunculus*, *Carex depauperata*, *Chenopodium urbicum*, *C. vulvaria*, *Crepis mollis*, *Fallopia dumetorum*, *Galium tricornutum*, *Herminium monorchis*, *Lithospermum arvense*, *Lolium temulentum*, *Lycopodium annotinum*, *Torilis arvensis*), two species are **NT** in England (*Eryngium campestre*, *Puccinellia fasciculata*), and

Table 4: The number and proportion of taxa in each Red List category for England, Wales and Great Britain. Hybrid taxa are not included in the England Red List and so have been excluded from the Wales and GB totals. Microspecies, including Hieracium and Taraxacum, are included in the totals.

IUCN threat categories	England		Wales		Great Britain	
	No. of taxa	% of total	No. of taxa	% of total	No. of taxa	% of total
Extinct (EX; EW; RE)	36	1.9	38	2.7	28	1.3
Critically Endangered (CR)	58	3.1	52	3.6	72	3.3
Endangered (EN)	137	7.4	62	4.3	145	6.6
Vulnerable (VU)	175	9.4	113	7.9	243	11.1
Subtotal	406	21.8	265	18.6	488	22.3
Data Deficient (DD)	57	3.1	14	1.0	80	3.7
Near Threatened (NT)	144	7.7	29	2.0	108	4.9
Least Concern (LC)	1252	67.3	1119	78.4	1515	69.1
Subtotal	1453	78.2	1162	81.4	1703	77.7
Total	406 + 1453 = 1859	100	265 + 1162 = 1427	100	488 + 1703 = 2191	100



Geranium purpureum (Peter Stroh) and *Saxifraga aizoides* (John Martin)– **RE** in Wales but **LC** in England.

11 species are **LC** in England (*Fumaria densiflora*, *Geranium purpureum*, *Imperatoria ostruthium* (*Peucedanum ostruthium*), *Lathyrus japonicus*, *Ophrys sphegodes*, *Orobanche elatior*, *Saxifraga aizoides*, *Scilla autumnalis*, *Sesleria caerulea*, *Thesium humifusum*, *Trifolium suffocatum*). No **RE** species in England are extant in Wales.

England does, however, have a greater proportion of **EN** and **VU** species and as a result has a slightly higher overall proportion of threatened taxa than Wales. The majority (68%) of **EN** and **VU** species are assessed as threatened in England because of a substantial decline in hectad distribution and/or a contraction in range (Criteria A and/or B). This compares with 36% of **EN** and **VU** species assessed as threatened under Criteria A and/or B in Wales. These results suggest that factors such as widespread changes in land use since 1930, particularly in southern and eastern England (e.g. Walker 2003), have had a disproportionate influence on the English flora.

6.2 Taxa with a lower threat status in England than in GB

After the exclusion of England-only taxa that have had a change to their threat status (see Section 6.9.1) and taxa that experienced the bulk of their decline in distribution prior to 1930 (see Section 6.7), just 11 taxa have a lower threat status in England compared to GB, namely *Alchemilla wichurae*, *Asparagus prostratus*, *Bromus secalinus*, *Crepis mollis*, *Euphrasia pseudokernerii*, *Fumaria parviflora*, *Myriophyllum verticillatum*, *Ranunculus arvensis*, *Rumex rupestris*, *Saxifraga hypnoides*, and *Scandix pecten-venensis*.

The lower threat status for *Asparagus prostratus* and *Rumex rupestris* is based on recent population counts that show considerable increases in the number of mature individuals. In the case of *A. prostratus*, previous declines have been reversed due to increased conservation effort, the discovery of one new location and the re-discovery of two further locations since 2001

(Rich *et al.* 2010a). For *Rumex rupestris*, a combination of increased survey effort, more intensive monitoring and, at some locations, an expansion in the availability (or occupation) of suitable habitat appears to have accounted for the increase in plant numbers over the past 10 years.

The *GB Red List* assessment of **EN** for *Alchemilla wichurae* was based on an AOO decline of 50% or higher, but much of this decline occurred in Scotland. In England decline was calculated at 44% between the two date classes (Bradshaw 2009), and so meets the **VU** threshold under Criterion A. Similarly, *Saxifraga hypnoides* experienced substantial declines in Scotland that were reflected in the **VU** *GB Red List* assessment, but the distribution in England has remained relatively stable. Consequently *S. hypnoides* has been assessed as **LC** in England.

Of the remaining seven taxa with a lower threat status in England than GB, England supports 75% or more of the GB population of *Bromus secalinus*, *Euphrasia pseudokernerii*, *Fumaria parviflora*, *Myriophyllum verticillatum*, *Ranunculus arvensis* and *Scandix pecten-veneris*. At first glance the differences in threat status are unexpected, although closer examination shows that for all six taxa the AOO and/or EOO decline figure calculated for England falls close to, but just below, the qualifying thresholds met for the GB threat status (see Section 8). Consequently the change in status for England may be either a result of analysing distributional trends between the two date classes using a more sensitive model than was available for the *GB Red List* (see Section 4.6), or because outlying subpopulations in Wales or Scotland that may have suffered considerable declines were excluded from the analysis.

Finally, although England holds c.82% of the GB distribution for *Crepis mollis* and the AOO

decline was calculated at 51% (**EN**) across the two date classes, recently published evidence (Walker & Robinson 2011) suggests that *C. mollis* was almost certainly overlooked in the 1987-1999 recording period. As a result the perceived decline calculated for the *GB* and *England Red Lists* is, in part, an artefact of recording rather than a 'real' decline. The threat status for this species has therefore been downgraded by one threat category (from **EN** to **VU**) to more accurately reflect its true status.

6.3 Taxa with a higher threat status in England than in GB

Differences between the GB and England Lists need to be interpreted with care, as a change in status may be due to a taxon qualifying under different threat criteria in different geographic areas (Dines 2008). For example, *Juncus capitatus* qualified as **VU** for the *GB Red List* under Criterion D2,



Juncus capitatus (Peter Stroh).

but for the *England Red List* the taxon is assessed as **EN** based on different Criteria (A2c;B1bc(iv)+2bc(iv);C2a(i)). We can be more confident in comparisons between the *GB* and *England Red Lists* if a taxon has either been assessed as threatened under Criterion A (decline in distribution) for both Red Lists, or if the taxon is **LC** in GB but has a higher level of threat in England under Criterion A. In such instances it is reasonable to infer that the higher threat status in England denotes a greater decline in England than across GB as a whole. However, it should be borne in mind that the AOO method of analysis used for the England List corrected for spatial and temporal recorder effort and, as such, may be more sensitive to changes between the two date classes than the method used for the *GB Red List*.

A total of 198 taxa have been assessed as having a higher level of threat in England than in GB. This total excludes England-only taxa that, following assessment, now have a different England status from that given in the *GB Red List* (see Section 6.9.1). Of these 198 taxa, 33 were assessed as threatened in both England and GB under Criterion A, 38 were **LC** in GB but qualified as threatened in

England under Criterion A (AOO and/or EOO decline of >30%), and 72 taxa were assessed as **LC** in GB but met the **NT** Criterion A threshold for AOO and/or EOO decline (20-30%). There are therefore at least 143 threatened or **NT** taxa in England (33 + 38 + 72) that we can conclude are faring worse in England than in other parts of GB (Table 5 and Table 6), with the causes of decline in England likely to be linked to widespread and substantial decline in quality (or outright loss) of key habitats since 1930, particularly in lowland England (Blackstock *et al.* 1999). Section 6.5 presents information on the habitat attributes for all threatened taxa in England, and Section 6.8 information on the widespread but declining taxa assessed as **NT**.

In addition to the taxa listed in Table 5 and 6, there are also a small number of taxa for which England has a higher threat status than GB because the region supports so little of the total GB resource. In such cases the English populations qualify as threatened under Criterion D (see Table 7). Many of these taxa reach their southern GB range limit in England, and so are of interest from a biogeographic perspective.

Table 5: The number of taxa for each threat category that are faring worse in England than in other parts of Great Britain.

	GB Red List threat status					
England Red List threat status	CR	EN	VU	NT	LC	Total
CR		2	0	0	0	2
EN			10	3	5	18
VU				18	33	51
NT					72	72
LC						
Total						143

Table 6: Taxa assessed under Criterion A that have a higher level of threat in England than in GB.

Taxon	GB Red List	England Red List
<i>Alchemilla glomerulans</i>	VU	EN
<i>Althaea officinalis</i>	LC	NT
<i>Anacamptis morio</i> (<i>Orchis morio</i>)	NT	VU
<i>Andromeda polifolia</i>	LC	NT
<i>Antennaria dioica</i>	LC	VU
<i>Apium inundatum</i>	LC	VU
<i>Arabis hirsuta</i>	LC	NT
<i>Artemisia maritima</i> (<i>Seriphidium maritimum</i>)	LC	NT
<i>Aster linosyris</i>	LC	EN
<i>Baldellia ranunculooides</i>	NT	VU
<i>Blysmus rufus</i>	LC	NT
<i>Botrychium lunaria</i>	LC	VU
<i>Briza media</i>	LC	NT
<i>Calluna vulgaris</i>	LC	NT
<i>Calystegia soldanella</i>	LC	VU
<i>Carex diandra</i>	NT	VU
<i>Carex echinata</i>	LC	NT
<i>Carex elata</i>	LC	NT
<i>Carex elongata</i>	LC	NT
<i>Carex lasiocarpa</i>	LC	VU
<i>Carex limosa</i>	LC	EN
<i>Carex magellanica</i>	LC	NT
<i>Carex pulicaris</i>	LC	NT
<i>Carex vesicaria</i>	LC	VU
<i>Carlina vulgaris</i>	LC	NT
<i>Carum carvi</i>	EN	CR
<i>Carum verticillatum</i>	LC	VU
<i>Catabrosa aquatica</i>	LC	VU
<i>Centunculus minimus</i> (<i>Anagallis minima</i>)	NT	EN
<i>Cephalanthera longifolia</i>	VU	EN
<i>Cerastium arvense</i>	LC	NT
<i>Chenopodium murale</i>	VU	EN
<i>Cichorium intybus</i>	LC	VU
<i>Cirsium heterophyllum</i>	LC	NT
<i>Comarum palustre</i> (<i>Potentilla palustris</i>)	LC	NT
<i>Cryptogramma crispa</i>	LC	VU
<i>Deschampsia setacea</i>	LC	VU
<i>Dianthus deltooides</i>	NT	VU
<i>Drosera anglica</i>	NT	EN
<i>Drosera intermedia</i>	LC	VU
<i>Drosera rotundifolia</i>	LC	NT
<i>Eleocharis acicularis</i>	LC	NT
<i>Eleocharis parvula</i>	LC	EN
<i>Epipactis palustris</i>	LC	NT
<i>Erica cinerea</i>	LC	NT

Taxon	GB Red List	England Red List
<i>Erica tetralix</i>	LC	NT
<i>Eriophorum angustifolium</i>	LC	VU
<i>Eryngium maritimum</i>	LC	NT
<i>Erysimum cheiranthoides</i>	LC	NT
<i>Euphorbia exigua</i>	NT	VU
<i>Euphrasia nemorosa</i>	LC	NT
<i>Euphrasia tetraquetra</i>	LC	NT
<i>Filago minima</i>	LC	NT
<i>Fragaria vesca</i>	LC	NT
<i>Fumaria purpurea</i>	LC	VU
<i>Fumaria vaillantii</i>	VU	EN
<i>Genista anglica</i>	NT	VU
<i>Genista tinctoria</i>	LC	VU
<i>Gentiana pneumonanthe</i>	LC	NT
<i>Gentianella amarella</i>	LC	NT
<i>Gentianella campestris</i>	VU	EN
<i>Geranium sanguineum</i>	LC	NT
<i>Geranium sylvaticum</i>	LC	NT
<i>Glaucium flavum</i>	LC	NT
<i>Gymnocarpium dryopteris</i>	LC	NT
<i>Hammarbya paludosa</i>	LC	VU
<i>Helianthemum nummularium</i>	LC	NT
<i>Herminium monorchis</i>	VU	EN
<i>Hottonia palustris</i>	LC	VU
<i>Hydrocotyle vulgaris</i>	LC	NT
<i>Hypericum elodes</i>	LC	NT
<i>Hypochaeris maculata</i>	NT	VU
<i>Inula helenium</i>	LC	NT
<i>Jasione montana</i>	LC	VU
<i>Juncus compressus</i>	NT	VU
<i>Juniperus communis</i>	LC	NT
<i>Knautia arvensis</i>	LC	NT
<i>Lamium confertum</i>	LC	EN
<i>Lathyrus linifolius</i>	LC	NT
<i>Lepidium campestre</i>	LC	NT
<i>Ligusticum scoticum</i>	LC	EN
<i>Limonium vulgare</i>	LC	NT
<i>Luronium natans</i>	LC	NT
<i>Lycopodium clavatum</i>	LC	VU
<i>Melampyrum pratense</i>	LC	NT
<i>Mentha arvensis</i>	LC	NT
<i>Mentha pulegium</i>	EN	CR
<i>Mentha suaveolens</i>	LC	NT
<i>Moenchia erecta</i>	LC	VU
<i>Myrica gale</i>	LC	NT
<i>Nardus stricta</i>	LC	NT
<i>Neottia nidus-avis</i>	NT	VU

Taxon	GB Red List	England Red List
<i>Oenanthe fistulosa</i>	LC	VU
<i>Oenanthe lachenalii</i>	LC	NT
<i>Ononis spinosa</i>	LC	NT
<i>Orobancha rapum-genistae</i>	NT	VU
<i>Oxalis acetosella</i>	LC	NT
<i>Papaver argemone</i>	VU	EN
<i>Parnassia palustris</i>	LC	VU
<i>Pedicularis palustris</i>	LC	VU
<i>Pedicularis sylvatica</i> subsp. <i>sylvatica</i>	LC	VU
<i>Phleum arenarium</i>	LC	NT
<i>Pilularia globulifera</i>	NT	VU
<i>Pinguicula vulgaris</i>	LC	VU
<i>Plantago media</i>	LC	NT
<i>Platanthera bifolia</i>	VU	EN
<i>Polygala serpyllifolia</i>	LC	NT
<i>Potamogeton alpinus</i>	LC	VU
<i>Potamogeton friesii</i>	NT	VU
<i>Potamogeton gramineus</i>	LC	NT
<i>Potamogeton praelongus</i>	NT	EN
<i>Potentilla erecta</i>	LC	NT
<i>Prunus cerasus</i>	LC	NT
<i>Pyrola minor</i>	LC	NT
<i>Pyrola rotundifolia</i> subsp. <i>rotundifolia</i>	NT	VU
<i>Radiola linoides</i>	NT	VU
<i>Ranunculus flammula</i>	LC	VU
<i>Rhynchospora alba</i>	LC	NT
<i>Ruppia maritima</i>	LC	NT
<i>Sagina nodosa</i>	LC	VU
<i>Sagina subulata</i>	LC	NT
<i>Salix repens</i>	LC	NT
<i>Salvia verbenaca</i>	LC	NT
<i>Sanicula europaea</i>	LC	NT
<i>Sedum villosum</i>	NT	VU
<i>Senecio aquaticus</i>	LC	NT
<i>Silene conica</i>	VU	EN
<i>Silene flos-cuculi</i> (<i>Lychnis flos-cuculi</i>)	LC	NT
<i>Solidago virgaurea</i>	LC	NT
<i>Sparganium natans</i>	LC	VU
<i>Succisa pratensis</i>	LC	NT
<i>Trifolium fragiferum</i>	LC	VU
<i>Triglochin palustris</i>	LC	NT
<i>Utricularia minor</i>	LC	VU
<i>Valeriana dioica</i>	LC	NT
<i>Valeriana officinalis</i>	LC	NT
<i>Veronica officinalis</i>	LC	NT
<i>Veronica scutellata</i>	LC	NT
<i>Vicia lutea</i>	NT	VU

Taxon	GB Red List	England Red List
<i>Viola canina</i> subsp. <i>canina</i>	LC	VU
<i>Viola lactea</i>	VU	EN
<i>Viola lutea</i>	LC	NT
<i>Zostera marina</i>	NT	VU

Table 7: Taxa meeting Near Threatened (NT) or threatened (CR, EN or VU) thresholds under Criterion D in England, for which a higher threat status in England is partly or mainly due to the fact that England supports a very low proportion (less than 10%) of the total GB hectad count.

GB Red List	Taxon	England Red List	Threat criteria	% GB hectads in England	No. of locations	Population estimate
VU	<i>Ajuga pyramidalis</i>	CR	D	2	1	18
LC	<i>Betula nana</i>	CR	D	2	3	<50
LC	<i>Carex atrata</i>	EN	D	5	4	<100
LC	<i>Carex pauciflora</i>	NT	B; D	4	14?	<10000
LC	<i>Cerastium alpinum</i>	VU	D1	2	3	<1000
LC	<i>Dryas octopetala</i>	VU	D2	4	4	?
LC	<i>Elatine hydropiper</i>	VU	D2	8	2	low 100s
LC	<i>Epilobium anagallidifolium</i>	VU	D1	4	5	<1000
LC	<i>Hierochloa odorata</i>	VU	D2	7	1	1 or 2 clones
LC	<i>Juncus balticus</i>	VU	D1; D2	2	3	86 'patches'
LC	<i>Lycopodium annotinum</i>	VU	D2	1	3	?
LC	<i>Nuphar pumila</i>	CR	D	2	1	<50
LC	<i>Orthilia secunda</i>	NT	D	6	c.15	c.2500
LC	<i>Phleum alpinum</i>	CR	D	6	1	<50
LC	<i>Poa alpina</i>	VU	D2	6	5	100s?
VU	<i>Polystichum lonchitis</i>	EN	D	7	14?	c.250
VU	<i>Pyrola media</i>	EN	D	7	11?	<250
VU	<i>Salix lapponum</i>	CR	D	1	2	<50
LC	<i>Saussurea alpina</i>	VU	D1	2	9?	<1000
LC	<i>Saxifraga nivalis</i>	CR	D	4	3	<50
LC	<i>Silene acaulis</i>	VU	D1	1	9	c.250
LC	<i>Subularia aquatica</i>	VU	D2	2	4?	?

6.4 Taxa extinct in England

A total of 25 taxa, including two English endemics (*Bromus interruptus*, *Senecio eboracensis*), have been assessed as Extinct (13), Regionally Extinct (9), or Extinct in the Wild (3) in England. Eight of these taxa were extinct by 1930 (*Asplenium fontanum*, *Carex davalliana*, *C. trinervis*, *Cystopteris alpina*, *Papaver bivalve* subsp. *hybridum*,

Polygonatum verticillatum, *Scheuchzeria palustris* and *Tephrosieris palustris*) but 17 have been lost between 1930 and the present day [*Achillea maritima* (*Otanthus maritimus*), *Arnoseris minima*, *Bromus interruptus*, *Carex maritima*, *Caucalis platycarpus*, *Crassula aquatica*, *Euphorbia peplis*, *Filago gallica*, *Galeopsis segetum*, *Hydrilla verticillata*, *Melampyrum sylvaticum*, *Mertensia maritima*, *Najas*

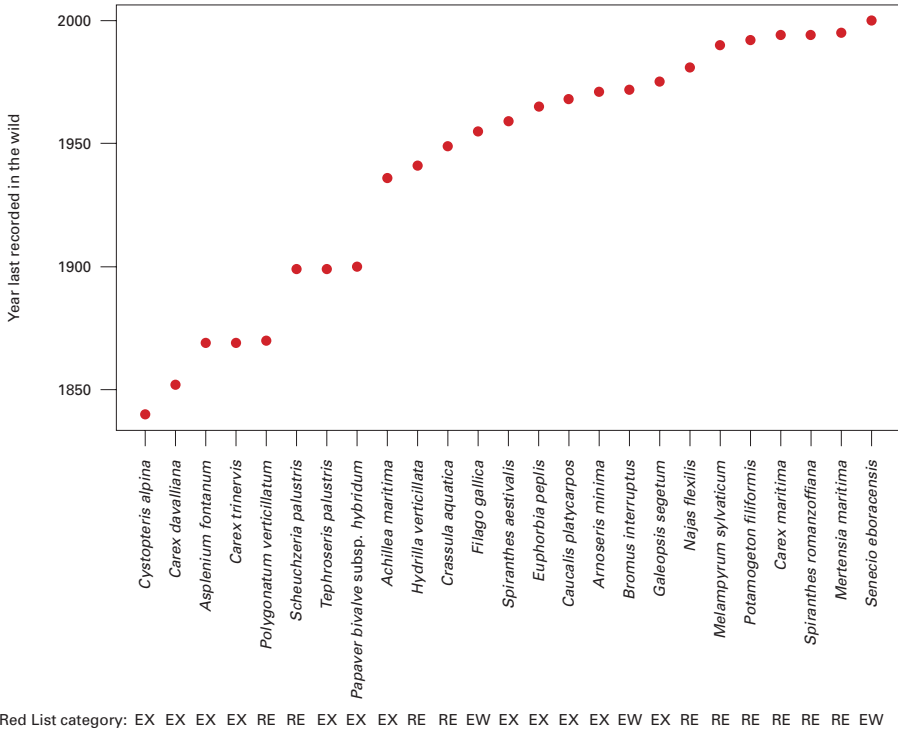


Figure 8: The last recorded date for 25 taxa considered to have become extinct in England since 1840. England Red List categories follow IUCN definitions listed in Section 4.3.

flexilis, *Potamogeton filiformis*, *Senecio eboracensis*, *Spiranthes aestivalis*, *S. romanzoffiana*], albeit that many of these species had already experienced substantial decline before 1930.

Six **RE** taxa were still extant in England in 1970 (*Najas flexilis*, *Melampyrum sylvaticum*, *Potamogeton filiformis*, *Spiranthes romanzoffiana*, *Mertensia maritima*, *Carex maritima*). Of these, all but *Mertensia maritima* were historically always rare in England (i.e. present in ≤ 8 hectads), while half have only ever recorded from a single English location (*N. flexilis*, *P. filiformis* and *S. romanzoffiana*). The probable reasons for the loss of all six species are discussed below.

Najas flexilis is a species of mesotrophic

lowland lakes and consequently is vulnerable to eutrophication (Preston & Croft 1997). Although it grows in deep water and is easily missed, repeated searches have failed to re-find it in its sole English location at Esthwaite Water, Westmorland. However, nutrient-stripping is in progress at this location, with the intention that eventually suitable conditions can be restored for this species, which could then be introduced using material from Scotland if restored conditions do not result in the reappearance of *N. flexilis* from a dormant seed bank. *Potamogeton filiformis*, unlike *N. flexilis*, is often found in eutrophic water (Preston 1994), but was last recorded in England at Rayburn Lake in South Northumberland, in 1992. It is just possible that the record from this location was only a transient occurrence in an apparently unsuitable site. Numerous fruitless searches

have taken place in the past 22 years, and until there is evidence to the contrary, it is considered to be **RE** in England.

The extinction in England of *S. romanzoffiana* is reported here for the first time, following numerous searches since it was last recorded in 1994. The species was discovered as new to England in July 1957 when a single flowering spike was found by Mr and Mrs P.C. Hall and Mrs B. Welch. Repeated unsuccessful searches have also been made for *Carex maritima* on Holy Island, North Northumberland, where it was last recorded for England in 1983 (Metherell 2011). This taxon appears to be retreating close to the southern limit of its range on the east coast but is stable and may be increasing in the far north and north-west (Lockton *et al.* 2009), possibly suggesting a 'range shift' response to climate change. This may also be a factor in the loss of *Mertensia maritima* from all of its west coast locations in England, with Dines (2008) noting that its loss from the Welsh coastline may be linked

to increased storm damage and warmer winter temperatures possibly inhibiting seed production. However, plants are still extant in south-west Scotland, the eastern coast of Northern Ireland and the Isle of Man, so it is plausible that future seed dispersal could lead to its reappearance in England (and Wales).

Melampyrum sylvaticum is a hemiparasitic plant found under light tree cover in steep wooded ravines and valleys in areas with high levels of atmospheric humidity (e.g. waterfalls, nearby flushes or natural springs). At its last English locality in Upper Teesdale a small number of plants (c.20) grew on bryophyte-rich ledges under a canopy of *Betula pubescens*, *Corylus avellana* and *Sorbus aucuparia* (Tennant 2008). Rabbit damage was identified as the probable cause for extinction at this location, although the author points out that the historical decline and gradual eradication of nearby relict subpopulations due to the loss and fragmentation of suitable habitat over a long



Spiranthes romanzoffiana (Mark Gurney).



Melampyrum sylvaticum (Bob Gibbons).

time period eventually left this species ‘with nowhere to go’ (Tennant 2008). Plants of *M. sylvaticum* were last seen in England in 1990.

6.5 Ecological characteristics of threatened taxa in England

The availability of trait information for most British and Irish taxa (Hill *et al.* 2004) enabled an examination of the ecological characteristics of 303 species that are threatened in England and 1100 species that are either **NT** or **LC**. Analysis of variance (ANOVA) was used to assess the significance of differences for continuous variables (e.g. Ellenberg indicator values) and a Chi-square test used to assess differences for categorical variables (e.g. Broad Habitat types).

6.5.1 Ellenberg indicator values

Ellenberg indicator values denote the position of an individual taxon along an environmental gradient (e.g. moisture, soil pH, soil reaction etc.) in comparison with other taxa. An indicator value therefore describes ecological tolerance and the realised ecological niche for a taxon (Hill *et al.* 1999).

The results of our analysis showed that overall, threatened taxa in England had a significantly greater association with open habitats (Ellenberg light, $F = 21.3$, $p < 0.001$) and either highly basic or acid soils (Ellenberg Rdiff, $F = 28.2$, $p < 0.001$) than non-threatened species (Figure 9). There was also a highly significant difference in terms of soil fertility, with

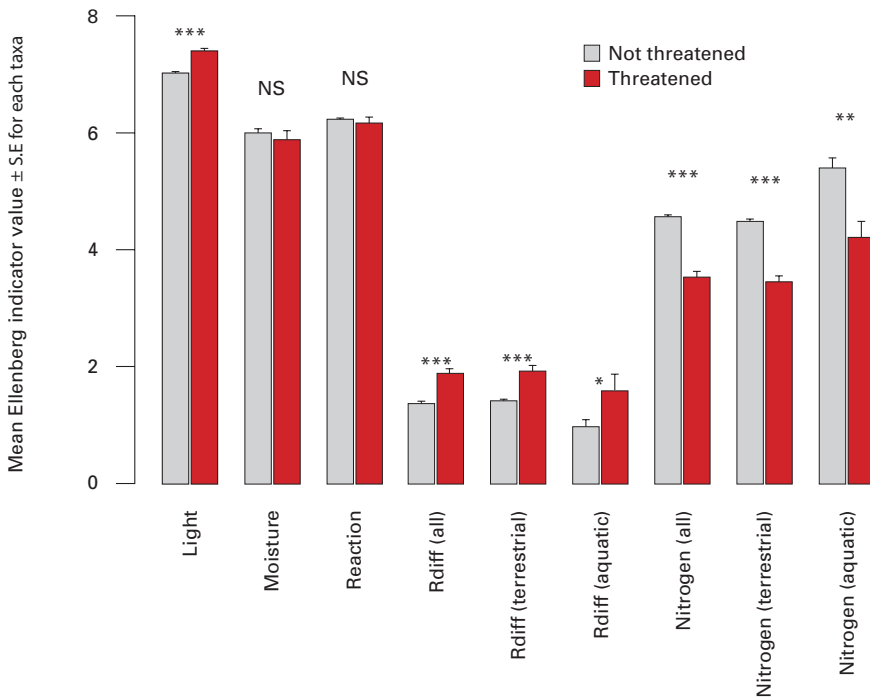


Figure 9: The differences in Ellenberg ecological indicator values for threatened and other species in England. Asterisks indicate where differences were significant (NS – not significant; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$). Rdiff provides an indication of the difference of soil reaction from neutrality. Rdiff and Nitrogen results are presented for all species and for aquatic (including *Zostera*) and terrestrial species only.

threatened species being much more strongly associated with infertile soils (Ellenberg nitrogen, $F = 75.7$, $P < 0.001$; Figure 9).

These results support the findings of a number of other studies that have shown a disproportionate loss of habitat specialists associated with 'unproductive', nutrient-poor habitats at a plot, county and national level in the second half of the 20th century (e.g. Preston 2000; Preston *et al.* 2002; Smart *et al.* 2005). The Ellenberg trait analysis results for Rdiff and nitrogen were comparable when terrestrial and aquatic species were analysed independently (Rdiff terrestrial species, $F = 24.7$, $p < 0.001$; Rdiff aquatic species, $F = 5.0$, $p < 0.05$; nitrogen terrestrial species, $F = 68.5$, $p < 0.001$, nitrogen aquatic species $F = 11.7$, $p < 0.01$; Figure 9). This suggests that similar drivers (e.g. eutrophication, habitat loss) are responsible for changes to both terrestrial and aquatic environments.

6.5.2 Plant height

Some of the most significant drivers affecting habitats over the past half century (e.g. cessation of grazing or cutting, eutrophication) have resulted in an increase in taller, more nutrient-demanding species and the loss of shorter species associated with unproductive conditions. We used measurements taken from Hill *et al.* (2004) to investigate whether shorter plant height was correlated with threat, as plant height acts as an indirect measure of habitat productivity and so provides a useful proxy for competitive ability. The results of this analysis showed that threatened species in England were on average significantly shorter than **NT** and **LC** species ($F = 30.71$, $p < 0.001$; Fig. 10).

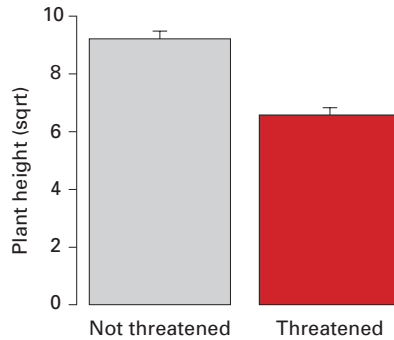


Figure 10: Bar chart showing the square root of plant height in relation to threatened (**CR**, **EN**, **VU**) and not-threatened (**NT**, **LC**) taxa.

6.5.3 Broad habitat types

The distribution of threatened species by broad habitat (Figure 11) reflected Ellenberg trait results. For a full description of all broad habitat types, see Hill *et al.* (2004). Habitats with the highest proportions of threatened species were also the least fertile (e.g. heaths and bogs), and they have probably suffered greater losses than more fertile habitats, especially in lowland England (see Thompson 1994; Walker & Preston 2006).

It was at first surprising to find that the montane broad habitat type was identified alongside heath and bog broad habitats as one of the three habitats supporting the largest numbers of England-threatened taxa. Undoubtedly this is partly due to drainage and changes to upland grazing systems, but is also a reflection of the disproportionate losses from lowland areas of species that are also associated with (and are often still widespread in) upland environments in England (e.g. *Carex lasiocarpa*, *Carex limosa*,

¹ Rdiff is a measure of difference from neutrality and is calculated from Ellenberg R (soil reaction) values as follows. The difference in R values (range 1-9) taking R 7 as neutral and taking into account the fact that R values are skewed towards the acid range. Therefore R 8 and 9 are scored as Rdiff 3 and 6 respectively whereas R 1, 2, 3, 4, 5 and 6 are taken as 6, 5, 4, 3, 2 and 1 respectively.

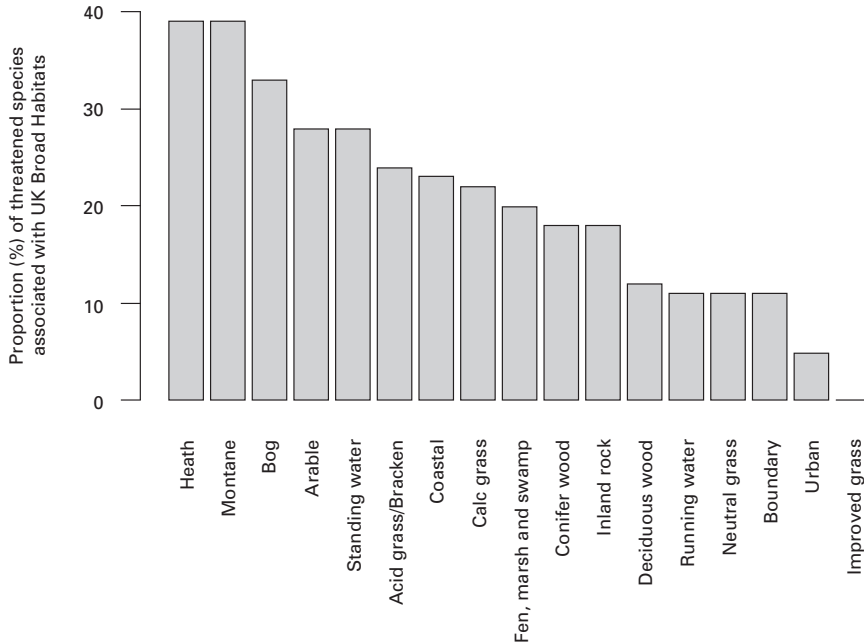


Figure 11: Bar chart showing the proportions of species associated with UK broad habitats that were classified as threatened in England. Note that the majority of species are assigned to more than one habitat (and a maximum of four).

Coeloglossum viride, *Drosera anglica*, *Hammarbya paludosa*, *Parnassia palustris*, *Pinguicula vulgaris*). In GB as a whole the marked declines of such species in lowland areas were in many instances not large enough to override their relative stability and abundance in upland habitats further north and west, resulting in many such species being assessed as **LC**.

A similarly high proportion of threatened species associated with arable habitats in England was also reported for GB (Preston *et al.* 2002) and Wales (Dines 2008) and reflects well-known historical trends associated with changes in agricultural practice (Robinson & Sutherland 2002; Walker *et al.* 2006). A similar proportion of taxa were assigned to the ‘standing water’ broad habitat type, with this group being threatened due to the widespread loss of roadside and farmland ponds, vegetation succession following abandonment,



Parnassia palustris – lost from much of lowland England but still quite widespread in upland environments (Bob Gibbons).

chemical pollution and perhaps most notably the eutrophication of water bodies, particularly in the lowlands (Williams *et al.* 1999; Wood *et al.* 2003).

The lower numbers of threatened species associated with other broad habitat types (e.g. coastal, calcareous grassland, inland rock and deciduous woodland) probably indicate both a greater level of protection from land-use pressures during the post-war period (see Section 6.6) and also to some extent their position as agriculturally marginal habitats. In the case of woodland, this result may seem at odds with the substantial habitat loss known to have occurred in England (Rackham 2008), but many woodland species could have held up reasonably well as a result of their occurrences in other (non-wooded) habitats, and despite some lamented losses, woodland loss since 1930 is much less than that for unimproved grassland, heath, and bog habitats which, unlike woods, have virtually disappeared from much of the lowland landscape.

The results for neutral grassland do not fully reflect the vulnerability of this habitat type, as, for example, species-rich unimproved habitats such as hay meadows and pastures are known to have been highly susceptible to changes in management over recent decades (Riley 2005). Nationwide surveys have shown that there was an overall increase in the areas of neutral grassland in England of 12.6% since 1998 and 46% between 1990 and 2007, although this 'new' habitat was predominantly species-poor, reflecting the substantial increases in set-aside land and tall neutral grassland in this period (Carey *et al.* 2008). It is likely that many neutral grassland taxa are only assessed as 'not threatened' because, like woodland taxa, they are able to persist along edge habitat (e.g. roadsides, trackways, hedgebanks, field borders, woodland edges, rides etc.).

As expected, the anthropogenic habitats 'urban' and 'improved grassland' had by far the lowest proportions of threatened species. The increase in area for both of these broad habitat types means that the distributions of taxa associated with these habitats are also increasing (see Braithwaite *et al.* 2006), with many of them now viewed as being ubiquitous. The very low proportion of England-threatened species in part reflects this landscape-scale change and also reflects the fact that, at least with improved grassland, species richness is not great and so the 'pool' of candidate taxa in this habitat is relatively low.

6.5.4 Major Biome Categories

Populations occurring at the edges of the geographic range of a taxon are likely, on average, to be more at risk than those occurring within the 'core' of that range. This is because they tend to be smaller and fewer nearer range margins, and therefore more susceptible to change. For the British and Irish Flora species have been classified with respect to the major (latitudinal) biomes in which they occur in Europe (Preston & Hill 1997). Although a comprehensive list of taxa reaching the edges of their GB range in England was not produced due to the reasons outlined in Section 5.2, an examination of 280 threatened species for which Major Biome Category (MBC) information was available (following Preston & Hill 1997 and Hill *et al.* 2004) showed that both Northern (Boreal) and Southern (Mediterranean) MBCs had significantly more threatened taxa than either the Temperate or Widespread MBCs ($\chi^2 = 43.66$, $p < 0.001$; Figure 12). A separate MBC assessment of all 58 species for which England holds $\leq 10\%$ of the GB hectad distribution found, unsurprisingly, that all but four of them were categorised as Northern (Boreal).

6.6 Taxa reaching absolute northern or southern European range limits in England

A total of 103 taxa reach the absolute northern or southern limit of their European range in England.

Northern European limits

94 taxa have their northern limits in England with the vast majority (95%) located in the 50-55°N latitudinal band that encompasses most of England (see Section 5.2 for more detail). Two taxa reach their northern European limits in the 45-50°N band that cover the Isles of Scilly (*Ornithopus pinnatus* and *Ophioglossum lusitanicum*), and three taxa have their northern limits in the 55-60°N band (*Blackstonia perfoliata*, *Dryopteris*

submontana and *Vulpia fasciculata*). Of the 94 taxa reaching their absolute northern European limit in England, 16 were assessed as threatened and four as NT, with 12 of these meeting the Criterion associated with very small or restricted populations (Criterion D; see Table 1). A further three taxa are currently on the Waiting List but reach their absolute northern European limit in the 50-55°N latitudinal band (*Aconitum napellus*, *Muscari neglectum* and *Serapias parviflora*), while two taxa that would have been at their northern European limits in England are now considered to be extinct [*Achillea maritima* (*Otanthus maritimus*) and *Euphorbia peplis*].

Southern European limits

Of the nine taxa at the southern limits of their European range in England, only *Ligusticum*

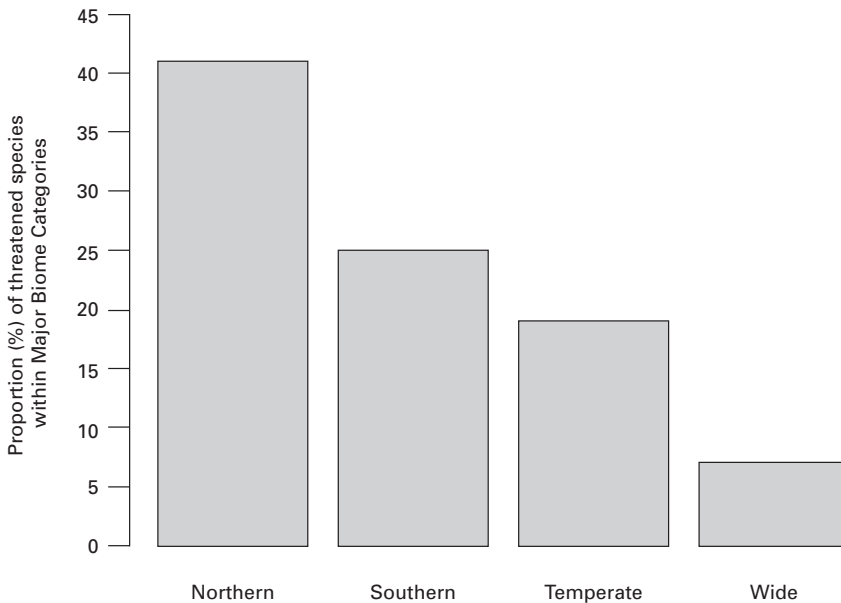


Figure 12: Bar chart showing the proportion of species classified as threatened within Major Biome (latitudinal) Categories. The MBC categories of Preston & Hill (1997) have been summarised as follows: 'Northern' = Arctic-montane, Boreo-arctic montane, Boreal-montane; 'Temperate' = Boreo-temperate, Temperate, Southern-temperate; 'Southern' = Mediterranean-atlantic, Mediterranean; 'Wide' = Wide-boreal, Wide-temperate.

scoticum was assessed as threatened (Table 8). *Alopecurus magellanicus* was assessed as **NT** based on population size and the remaining seven taxa were assessed as **LC**.

All taxa that having their absolute southern European limits in England were located within the 50°N to 55°N latitudinal band.

Table 8: Threatened and Near Threatened (**NT**) taxa reaching their northern or southern absolute European range limits in England.

Taxon	England Red List	European edge of range
<i>Achillea maritima</i> (<i>Otanthus maritimus</i>)	EX	N ₂
<i>Ajuga chamaepitys</i>	EN	N ₂
<i>Allium sphaerocephalon</i>	VU	N ₂
<i>Alopecurus magellanicus</i>	NT	S ₂
<i>Arabis scabra</i>	VU	N ₂
<i>Bupleurum baldense</i>	EN	N ₂
<i>Cynoglossum germanicum</i>	NT	N ₂
<i>Cystopteris diaphana</i>	VU	N ₂
<i>Damasonium alisma</i>	CR	N ₂
<i>Euphorbia peplis</i>	EX	N ₂
<i>Frankenia laevis</i>	NT	N ₂
<i>Galium parisiense</i>	VU	N ₂
<i>Helianthemum apenninum</i>	VU	N ₂
<i>Iberis amara</i>	VU	N ₂
<i>Illecebrum verticillatum</i>	EN	N ₂
<i>Isoetes histrix</i>	VU	N ₂
<i>Koeleria vallesiana</i>	NT	N ₂
<i>Lactuca saligna</i>	EN	N ₂
<i>Lathyrus aphaca</i>	VU	N ₂
<i>Ligusticum scoticum</i>	EN	S ₂
<i>Lobelia urens</i>	VU	N ₂
<i>Mibora minima</i>	NT	N ₂
<i>Minuartia hybrida</i>	EN	N ₂
<i>Ophioglossum lusitanicum</i>	VU	N ₁
<i>Orchis anthropophora</i> (<i>Aceras anthropophorum</i>)	EN	N ₂
<i>Orchis simia</i>	VU	N ₂
<i>Petrorhagia nanteuillii</i>	VU	N ₂
<i>Pyrus cordata</i>	VU	N ₂
<i>Romulea columnae</i>	VU	N ₂
<i>Sorbus domestica</i>	CR	N ₂
<i>Spartina maritima</i>	EN	N ₂
<i>Stachys germanica</i>	EN	N ₂
<i>Trifolium bocconeii</i>	EN	N ₂
<i>Trifolium ochroleucon</i>	VU	N ₂
<i>Vicia parviflora</i>	VU	N ₂

6.7 Taxa assessed as LC in England but showing a marked decline when pre-1930 records are included

IUCN Guidance states that AOO and EOO decline should be measured over a period of three generations with a minimum of a 10 year trend. Information on generational length is lacking for most taxa in GB, so we decided, as in the *GB Red List*, to measure decline by comparing data collected in the two recording periods 1930-69 and 1987-1999.

In the course of examining the results, however, it became clear that for some taxa the final status assessment of LC was at odds with the magnitude of their overall apparent declines as revealed in the *New Atlas* (e.g. *Anagallis tenella*, *Carex appropinquata*, *C. dioica*, *Cirsium dissectum*, *Eleogiton fluitans*, *Eriophorum latifolium*, *Gagea lutea*, *Huperzia selago*, *Littorella uniflora*, *Meum athamanticum*, *Vicia sylvatica*). In light of these findings, a simple analysis was

performed to calculate for each LC taxon the post-1986 hectad count as a proportion of the total hectad count across all time periods (i.e. including pre-1930 records).

The results showed that for 157 LC taxa in England there had been considerable (>30%) overall declines when pre-1930 records were included in the total hectad count. It is likely that the distribution of many of these taxa had already 'bottomed out' prior to 1930, and they have since persisted, often in very low numbers, within small and scattered refugia across a highly fragmented landscape; as such, we would argue that they nevertheless remain of conservation concern and potentially vulnerable to mis-management and further habitat loss in the future.

The failure to recognise the sometimes perilous state of these 'historic decliners' as anything other than LC could be seen as a deficiency of the Red Listing process. Yet such results also beg the question as to why



Three 'pre-1930 decliners' assessed as LC in England (left *Anagallis tenella* (Janet Negal), centre *Eleocharis quinqueflora*, right *Gagea lutea* (Peter Stroh)).

the distribution of so many of these taxa has remained relatively stable since 1930. The statutory protection of sites commenced in earnest following the publication of the Government White Paper *Conservation of Nature in England and Wales* and the passing of the *National Parks and Access to the Countryside Act* in 1949, although the informal action of deliberately setting aside land for the preservation of its biological interest began in England as early as 1821 (Moore 1987). By the mid-20th century the decline of once widespread taxa and the loss and vulnerability of associated habitats were clear to ecologists, leading to a representative sample being declared as NNRs and, later, notified as SSSIs. It would appear that, as a direct result of these actions, the downward trend of many of these taxa in England was subsequently slowed down or arrested by shielding them from the widespread land-use changes that have since taken place across much of England.



Whilst this achievement is clearly very welcome, the AOO results for this Red List still show that 15 of these taxa experienced a statistically significant decline of between 10-19% since 1930 (*Anagallis tenella*, *Apium graveolens*, *Artemisia absinthium*, *Berberis vulgaris*, *Campanula glomerata*, *Carex distans*, *C. pallescens*, *Cirsium dissectum*, *Hypericum montanum*, *Lathyrus sylvestris*, *Lepidium heterophyllum*, *Lithospermum officinale*, *Oenanthe aquatica*, *Paris quadrifolia*, *Platanthera chlorantha*), and it is probable that this list would lengthen considerably if it were possible to analyse declines at a higher (e.g. monad) resolution (see for example Byfield & Pearman 1996). Lawton *et al.* (2010) recognised that relatively small and isolated SSSIs cannot be expected to sustain indefinitely a high level of protection for all species found within their boundaries. Rather, the authors advocate a 'landscape-scale' approach to conservation by restoring a coherent and resilient ecological network that links species-rich habitats and creates connections for the dispersal of propagules and the wider establishment of species. Restoring or recreating habitat for habitat specialists is not easily achieved (Walker *et al.* 2004), but several relatively large habitat restoration projects are already underway in England (e.g. Avalon Marshes in Somerset, the Great Fen Project in Huntingdonshire; the Knepp Estate in West Sussex; The Wicken Fen Vision in Cambridgeshire), and initiatives such as these, alongside the wealth of scientific literature already available on the subject, will continue to provide evidence and best practice on how taxa within SSSIs and other protected sites can 'jump the fence' and begin to re-establish themselves across the wider countryside.

6.8 Declining widespread taxa assessed as Near Threatened

The AOO analysis produced a number of

results that may seem surprising to some, perhaps none more so than the NT status assigned to taxa that may be presumed by many to be under no immediate threat,

Eight 'widespread' taxa assessed as NT due to a decline of between 20% and 30%.



Briza media (Peter Stroh).



Campanula rotundifolia (Bob Ellis).



Helianthemum nummularium (Peter Stroh).



Knautia arvensis (Bob Gibbons).

notably *Briza media*, *Calluna vulgaris*,
Campanula rotundifolia, *Cruciata laevipes*,
Drosera rotundifolia, *Erica cinerea*, *Erica*
tetralix, *Fragaria vesca*, *Helianthemum*

nummularium, *Hydrocotyle vulgaris*,
Knautia arvensis, *Nardus stricta*, *Oxalis*
acetosella, *Plantago media*, *Potentilla*
erecta, *Sanicula europaea*, *Silene flos-cuculi*,



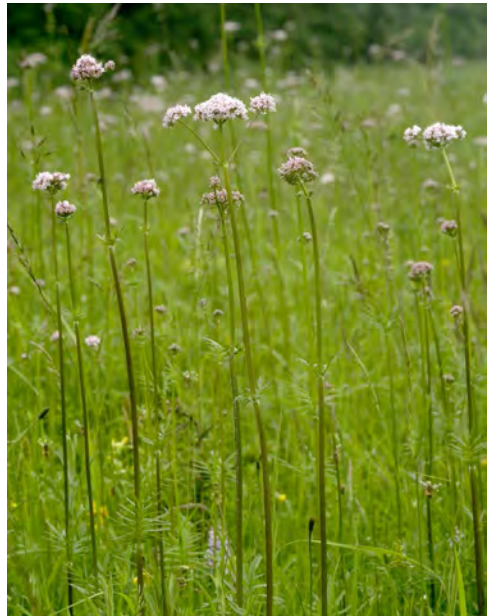
Oxalis acetosella (Peter Stroh).



Sanicula europaea (Peter Stroh).



Silene flos-cuculi (*Lychnis flos-cuculi*) (Peter Stroh).



Valeriana officinalis (Peter Stroh).

Solidago virgaurea, *Succisa pratensis*,
Valeriana officinalis, *Veronica officinalis*,
Veronica scutellata.

At first glance it seems remarkable that many of these species were so close to being assessed as **VU** in England. However, the *New Atlas* accounts for all but three of the 22 species listed above mention decline in range or population, and closer examination of this suite of species reveals a pattern of decline similar to, but less severe than, many taxa assessed as threatened. For example, many have suffered their greatest losses in lowland England and display a strong preference for infertile and moderately acidic soils (e.g. *Calluna vulgaris*, *Drosera rotundifolia*, *Erica cinerea*, *E. tetralix*, *Nardus stricta*, *Potentilla erecta*), whereas others (e.g. *Hydrocotyle vulgaris*, *Silene flos-cuculi*, *Succisa pratensis*, *Veronica scutellata*) are associated with wet, generally infertile soils that may be particularly prone to habitat loss or damage as a result of eutrophication, loss of grazing and/or hydrological changes including land drainage.

The loss in England of lowland heathland is well documented (e.g. Moore 1962; Bullock & Pakeman 1996), as is the widespread and extensive loss of unimproved grassland and lowland raised bog, and the conversion to farming or forestry of around 40% of ancient woodland in the third quarter of the 20th century (Rackham 2008). More recently, declines in some grassland species, for example *Campanula rotundifolia*, were found to have a negative association with increasing levels of atmospheric nitrogen (N) deposition, probably due to an associated increased growth of lush grasses in the surrounding sward (Stevens *et al.* 2011).

As already noted in Section 6.7, the threat posed to **LC** historic decliners such as *Eriophorum latifolium*, *Gagea lutea*,

Hippocrepis comosa, *Pinguicula lusitanica* and *Trollius europaeus* may have helped to ensure that they are well represented, and hopefully well protected, within the SSSI series. However, species such as *Briza media*, *Nardus stricta*, *Oxalis acetosella* and *Succisa pratensis* would still have been relatively widespread and common in England in the latter half of the last century, and while they are undeniably well represented within protected sites, they also have (or had) a much greater presence outside these sites, in what is often termed the 'wider countryside'. It should therefore come as little surprise that some of these species have undergone declines in England severe enough for them to be categorised as **NT** in the *England Red List*.

6.9 Taxa for which England has a particular responsibility

6.9.1 England-only taxa

In GB there are 272 taxa confined to England, including 75 taxa that are endemic to England (annotated in the Main List). The list includes 44 *Hieracium*, 17 *Sorbus* and five *Taraxacum* taxa but excludes *Rubus* microspecies. *Rubus* is a particularly complex genus, largely apomictic, with over 400 microspecies recognised in Britain and Ireland (Cheffings & Farrell 2005). The introduction to the *GB Red List* cites 28 England-endemic *Rubus* taxa that occur in five or fewer hectads (*R. briggsii*, *R. britannicus*, *R. bucknallii*, *R. castrensis*, *R. daltrii*, *R. devoniensis*, *R. diversiarmatus*, *R. dobuniensis*, *R. durescens*, *R. herefordensis*, *R. hyposericeus*, *R. iodnephes*, *R. longifrons*, *R. mercicus*, *R. obesifolius*, *R. permundus*, *R. pervalidus*, *R. pliocenicus*, *R. powellii*, *R. pseudoplinthostylus*, *R. putneiensis*, *R. regillus*, *R. rotundifolius*, *R. sagittarius*, *R. salteri*, *R. spadix*, *R. tresidderi*, *R. wolley-dodii*). The *GB Red List* authors took the decision to omit all *Rubus* microspecies from the formal listing process. We have followed

the same approach, and as such 28 *Rubus* taxa are omitted from the figure of 272 England-only taxa given above.

143 England-only taxa (including 18 *Hieracium*, 16 *Sorbus* and one *Taraxacum*) were assessed as threatened, 26 as NT (including eight *Hieracium*), 15 taxa as either

DD or currently on the **WL** and five taxa listed as **EW** or **EX**. The remaining 83 taxa were assessed as **LC**. Table 10 lists the 143 England-only threatened (**CR**, **EN** and **VU**) taxa; all England-only taxa (including **NT**, **LC**, **DD**, **EW**, **EX** and those on the **WL**) are shown as such in the Main List.

Table 10: *England-only threatened (CR, EN, VU) taxa.*

Taxon	England Red List	England endemic?
<i>Ajuga chamaepitys</i>	EN	
<i>Alchemilla acutiloba</i>	VU	
<i>Alchemilla micans</i>	EN	
<i>Alchemilla monticola</i>	EN	
<i>Alchemilla subcrenata</i>	EN	
<i>Alisma gramineum</i>	CR	
<i>Allium sphaerocephalon</i>	VU	
<i>Apium repens</i>	EN	
<i>Arabis scabra</i>	VU	
<i>Arenaria norvegica</i> subsp. <i>anglica</i>	EN	yes
<i>Armeria maritima</i> subsp. <i>elongata</i>	CR	
<i>Artemisia campestris</i> subsp. <i>campestris</i>	EN	
<i>Atriplex pedunculata</i>	CR	
<i>Bupleurum baldense</i>	EN	
<i>Carex cespitosa</i>	CR	
<i>Carex depauperata</i>	EN	
<i>Carex ericetorum</i>	VU	
<i>Carex flava</i>	VU	
<i>Carex vulpina</i>	VU	
<i>Centaurea calcitrapa</i>	EN	
<i>Cephalanthera damasonium</i>	VU	
<i>Cephalanthera rubra</i>	CR	
<i>Clinopodium menthifolium</i>	VU	
<i>Corrigiola litoralis</i>	EN	
<i>Crepis foetida</i>	CR	
<i>Crepis praemorsa</i>	VU	
<i>Cyperus fuscus</i>	VU	
<i>Cypripedium calceolus</i>	CR	
<i>Cystopteris diaphana</i>	VU	
<i>Dactylorhiza incarnata</i> subsp. <i>ochroleuca</i>	CR	
<i>Damasonium alisma</i>	CR	
<i>Dianthus gratianopolitanus</i>	VU	
<i>Dryopteris cristata</i>	EN	
<i>Epipactis sancta</i>	EN	yes
<i>Epipogium aphyllum</i>	CR	
<i>Equisetum ramosissimum</i>	VU	
<i>Euphorbia hyberna</i>	VU	

Taxon	England Red List	England endemic?
<i>Euphrasia officinalis</i> subsp. <i>anglica</i>	EN	
<i>Euphrasia vigursii</i>	EN	yes
<i>Fallopia dumetorum</i>	VU	
<i>Filago lutescens</i>	EN	
<i>Filago pyramidata</i>	EN	
<i>Galium parisiense</i>	VU	
<i>Galium pumilum</i> s.l.	EN	
<i>Galium tricornutum</i>	CR	
<i>Gentiana verna</i>	VU	
<i>Gentianella germanica</i>	VU	
<i>Gentianopsis ciliata</i> (<i>Gentianella ciliata</i>)	CR	
<i>Gladiolus illyricus</i>	VU	
<i>Helianthemum apenninum</i>	VU	
<i>Helianthemum oelandicum</i> subsp. <i>levigatum</i>	VU	yes
<i>Hieracium aequiserratum</i>	CR	yes
<i>Hieracium bakeranum</i>	EN	yes
<i>Hieracium candelabrae</i>	VU	yes
<i>Hieracium cantianum</i>	EN	yes
<i>Hieracium filisquamum</i>	CR	yes
<i>Hieracium integratum</i>	CR	probably
<i>Hieracium itunense</i>	CR	yes
<i>Hieracium lakelandicum</i>	VU	yes
<i>Hieracium mirandum</i>	CR	yes
<i>Hieracium naviense</i>	CR	yes
<i>Hieracium ornatilorum</i>	EN	yes
<i>Hieracium peroblongum</i>	EN	yes
<i>Hieracium portlandicum</i>	EN	yes
<i>Hieracium sinuolatum</i>	EN	yes
<i>Hieracium stenolepiforme</i>	EN	yes
<i>Hieracium subgracilentipes</i>	EN	yes
<i>Hieracium subprasiniifolium</i>	EN	yes
<i>Hieracium vagicola</i>	EN	yes
<i>Iberis amara</i>	VU	
<i>Illecebrum verticillatum</i>	EN	
<i>Isoetes histrix</i>	VU	
<i>Juncus pygmaeus</i>	EN	
<i>Lactuca saligna</i>	EN	
<i>Lamiastrum galeobdolon</i> subsp. <i>galeobdolon</i>	VU	
<i>Lathyrus aphaca</i>	VU	
<i>Leersia oryzoides</i>	EN	
<i>Lobelia urens</i>	VU	
<i>Luzula pallescens</i> (<i>Luzula pallidula</i>)	CR	
<i>Maianthemum bifolium</i>	VU	
<i>Medicago minima</i>	VU	
<i>Melampyrum cristatum</i>	EN	
<i>Microthlaspi perfoliatum</i> (<i>Thlaspi perfoliatum</i>)	VU	
<i>Minuartia stricta</i>	EN	
<i>Najas marina</i>	VU	

Taxon	England Red List	England endemic?
<i>Onobrychis viciifolia</i>	VU	
<i>Ophioglossum lusitanicum</i>	VU	
<i>Ophrys fuciflora</i>	VU	
<i>Orchis anthropophora</i> (<i>Aceras anthropophorum</i>)	EN	
<i>Orchis militaris</i>	VU	
<i>Orchis purpurea</i>	VU	
<i>Orchis simia</i>	VU	
<i>Orobanche picridis</i> (<i>Orobanche artemisiae-campestris</i>)	VU	
<i>Petrorhagia nanteuilii</i>	VU	
<i>Petrorhagia prolifera</i>	EN	
<i>Phyteuma spicatum</i>	EN	
<i>Polygala amarella</i>	EN	
<i>Polygonum maritimum</i>	VU	
<i>Potamogeton acutifolius</i>	EN	
<i>Potamogeton nodosus</i>	VU	
<i>Pulicaria vulgaris</i>	EN	
<i>Pulmonaria obscura</i>	VU	
<i>Pulsatilla vulgaris</i>	VU	
<i>Pyrus cordata</i>	VU	
<i>Ranunculus ophioglossifolius</i>	CR	
<i>Romulea columnae</i>	VU	
<i>Schoenoplectus triqueter</i>	CR	
<i>Scirpoides holoschoenus</i>	VU	
<i>Scleranthus perennis</i> subsp. <i>prostratus</i>	EN	yes
<i>Selinum carvifolia</i>	EN	
<i>Senecio paludosus</i>	CR	
<i>Silene otites</i>	EN	
<i>Sium latifolium</i>	EN	
<i>Sorbus admonitor</i>	EN	yes
<i>Sorbus bristoliensis</i>	VU	yes
<i>Sorbus cheddarensis</i>	CR	yes
<i>Sorbus eminentoides</i>	CR	yes
<i>Sorbus evansii</i>	EN	yes
<i>Sorbus greenii</i>	EN	yes
<i>Sorbus herefordensis</i>	EN	yes
<i>Sorbus leighensis</i>	EN	yes
<i>Sorbus margaretae</i>	EN	yes
<i>Sorbus parviloba</i>	CR	yes
<i>Sorbus richii</i>	EN	yes
<i>Sorbus rupicoloides</i>	CR	yes
<i>Sorbus spectans</i>	EN	yes
<i>Sorbus subcuneata</i>	VU	yes
<i>Sorbus vexans</i>	EN	yes
<i>Sorbus wilmottiana</i>	EN	yes
<i>Spartina maritima</i>	EN	
<i>Stachys germanica</i>	EN	
<i>Tephrosieris integrifolia</i>	VU	

Taxon	England Red List	England endemic?
<i>Taraxacum hygrophilum</i>	VU	
<i>Teucrium scordium</i>	EN	
<i>Thyselium palustre</i> (<i>Peucedanum palustre</i>)	VU	
<i>Trifolium bocconeii</i>	EN	
<i>Trifolium ochroleucon</i>	VU	
<i>Turritis glabra</i> (<i>Arabis glabra</i>)	EN	
<i>Veronica triphyllos</i>	CR	
<i>Veronica verna</i>	EN	
<i>Vicia parviflora</i>	VU	
<i>Viola canina</i> subsp. <i>montana</i>	EN	
<i>Viola persicifolia</i>	CR	

It could reasonably be assumed that the *England Red List* status assigned to the 272 England-only taxa would be the same as that given in the *GB Red List*. This is broadly true for taxa that qualified as threatened under Criterion A because the same two time periods were used to assess threat for both Lists. However, the model used for the England AOO analysis did reveal a greater decline for three taxa assessed as threatened in England (*Melampyrum cristatum*, *Onobrychis viciifolia*, *Trifolium ochroleucon*) and suggested a lesser decline for six (*Centaurea calcitrapa*, *Orchis purpurea*, *Primula farinosa*, *Puccinellia fasciculata*, *Pulicaria vulgaris*, *Tephrosia integrifolia* subsp. *integrifolia*). For these nine taxa, the level of threat for the England List has been adjusted accordingly. Furthermore, an AOO decline of less than 20% was calculated for five taxa assessed in the GB List as threatened (*Clinopodium calamintha*) or **NT** (*Arum italicum* subsp. *neglectum*, *Himantoglossum hircinum*, *Primula elatior* and *Stratiotes aloides*) under Criterion A. These England-only species have been assessed here as **LC**.

The threat status for a further 28 England-only taxa now differs from the GB status following collation of more up-to-date information on population size and numbers of localities. Of these, 15 have been 'downgraded' (i.e. assigned a lower level of

threat than that presently assigned to them in the *GB Red List*) and 12 have been 'upgraded' (i.e. assigned a higher level of threat). In addition, one England-only taxon, *Muscari neglectum*, is in the process of being moved to the GB **WL** as a result of doubts concerning its native status (Pearman 2013), and is accordingly listed here as **WL** too.

Among the England-only taxa that have been 'upgraded', the elevation in threat status for *Gladiolus illyricus*, *Ranunculus ophioglossifolius*, *Selinum carvifolia*, *Trifolium bocconeii* and *Viola persicifolia* is of particular concern, reflecting a recent and substantial drop in population size and/or habitat loss or degradation – despite the fact that all extant populations lie within SSSIs.

England-only taxa with a lower threat status include *Crepis foetida*, previously considered to be **EW** in England (and therefore GB) since 1980 but re-discovered growing on consolidated shingle at Lydd-on-Sea, Kent, in July 2010 (G. Kitchener pers. comm.). Although re-introductions of *C. foetida* took place in the early 1990s and late 2000s within c.2-3km of the recent discovery, these were mostly unsuccessful and it is therefore unlikely that the 'new' location is a result of naturally dispersed seed from previously introduced material. Consequently *C. foetida* is now assessed as **CR** in England.



Ranunculus ophioglossifolius (Bob Gibbons).



Gladiolus illyricus (Fred Rumsey).

The change in status for *Clinopodium menthifolium* and *Corrigiola litoralis* is a consequence of positive long-term conservation action. *Clinopodium menthifolium* is only known from the Rowridge Valley SSSI on the Isle of Wight, and was on the brink of extinction by 1959 (Marston 2007). In 1960, the Isle of Wight Natural History and Archaeological Society began conservation efforts; starting from a low point in the late 1950s of just ‘five clumps’, monitoring in 2012 estimated a population of close to 2000 flowering shoots. *Corrigiola litoralis* persists at one native location at Slapton Ley NNR, South Devon, where it grows on open gravelly margins in the ‘drawdown’ zone of a coastal freshwater lake. The change in status from **CR** to **EN** reflects an increase in the number of plants as a consequence of concerted efforts over the past 20 years to learn more about the ecological niche and management requirements of this rare species. Investigations have led to the successful ‘bulking up’ of the very small extant

native population using material of local origin.



Clinopodium menthifolium (Bob Gibbons).



Corrigiola litoralis (Bob Gibbons).

6.9.2 Taxa for which England holds 75% or more of the GB hectad distribution, excluding England-only taxa

We calculated the proportion of the GB distribution of each taxon found within England, in order to identify those taxa for which England holds greater than three-quarters of the GB hectad distribution.

The threshold figure of 75% or greater was thought appropriate, considering the size of England relative to GB, for identifying those taxa – whether threatened or not – for which England has a particular responsibility in a GB context. The Main List indicates all taxa that have 75% or more of their GB distribution in England; Table 11 lists all those that are assessed as threatened in England.

Table 11: Taxa threatened in England for which England holds $\geq 75\%$ of the GB hectad distribution (excluding England-only taxa – see Section 6.9.1).

Taxon	England Red List	% GB hectad distribution in England
<i>Adonis annua</i>	EN	98
<i>Anacamptis morio</i> (<i>Orchis morio</i>)	VU	88
<i>Anthemis arvensis</i>	EN	88
<i>Anthemis cotula</i>	VU	94
<i>Blysmus compressus</i>	VU	91
<i>Bupleurum rotundifolium</i>	CR	94
<i>Bupleurum tenuissimum</i>	VU	92
<i>Campanula patula</i>	CR	90
<i>Campanula rapunculus</i>	EN	85
<i>Carum carvi</i>	CR	76
<i>Chamaemelum nobile</i>	VU	94
<i>Chenopodium bonus-henricus</i>	VU	82
<i>Chenopodium glaucum</i>	VU	95
<i>Chenopodium murale</i>	EN	95
<i>Chenopodium urbicum</i>	CR	82
<i>Chenopodium vulvaria</i>	EN	91
<i>Cicendia filiformis</i>	VU	76
<i>Cichorium intybus</i>	VU	86
<i>Clinopodium acinos</i>	VU	97
<i>Crepis mollis</i>	VU	82

Taxon	England Red List	% GB hectad distribution in England
<i>Cuscuta epithymum</i>	VU	97
<i>Daphne mezereum</i>	VU	92
<i>Dianthus armeria</i>	EN	89
<i>Euphorbia exigua</i>	VU	95
<i>Euphrasia pseudokernerii</i>	VU	96
<i>Euphrasia rivularis</i>	VU	75
<i>Fumaria vaillantii</i>	EN	97
<i>Galeopsis angustifolia</i>	CR	98
<i>Genista tinctoria</i>	VU	86
<i>Groenlandia densa</i>	VU	99
<i>Hieracium caesionigrescens</i>	CR	75
<i>Hieracium eminentiforme</i>	EN	86
<i>Hieracium rigens</i>	EN	87
<i>Hordeum marinum</i>	VU	94
<i>Hottonia palustris</i>	VU	98
<i>Hydrocharis morsus-ranae</i>	VU	94
<i>Hyoscyamus niger</i>	VU	87
<i>Hypochaeris glabra</i>	VU	88
<i>Hypochaeris maculata</i>	VU	90
<i>Hypopitys monotropa (Monotropa hypopitys)</i>	EN	86
<i>Juncus compressus</i>	VU	96
<i>Limonium recurvum</i>	VU	75
<i>Lithospermum arvense</i>	EN	98
<i>Lolium temulentum</i>	CR	83
<i>Lythrum hyssopifolia</i>	EN	86
<i>Melittis melissophyllum</i>	VU	92
<i>Mentha pulegium</i>	CR	97
<i>Minuartia hybrida</i>	EN	99
<i>Misopates orontium</i>	VU	84
<i>Moenchia erecta</i>	VU	83
<i>Myosurus minimus</i>	VU	98
<i>Neotinea ustulata (Orchis ustulata)</i>	EN	98
<i>Neottia nidus-avis</i>	VU	76
<i>Nepeta cataria</i>	VU	96
<i>Oenanthe fistulosa</i>	VU	91
<i>Ophrys insectifera</i>	VU	97
<i>Orobanche purpurea</i>	VU	94
<i>Papaver argemone</i>	EN	93
<i>Persicaria mitis</i>	VU	94
<i>Potamogeton compressus</i>	EN	87
<i>Ranunculus arvensis</i>	EN	94
<i>Rumex rupestris</i>	VU	87
<i>Scandix pecten-veneris</i>	EN	97
<i>Silene conica</i>	EN	91
<i>Silene gallica</i>	EN	75
<i>Silene noctiflora</i>	VU	97
<i>Sorbus domestica</i>	CR	80

Taxon	England Red List	% GB hectad distribution in England
<i>Sorbus eminens</i>	VU	88
<i>Stellaria palustris</i>	VU	87
<i>Torilis arvensis</i>	EN	98
<i>Trifolium fragiferum</i>	VU	92
<i>Valerianella dentata</i>	EN	95
<i>Valerianella rimosa</i>	EN	96
<i>Vicia lutea</i>	VU	81

7 Examples of applying IUCN threat criteria

Arriving at a final threat status for a taxon can appear to be a convoluted process, but in fact, as we hope to demonstrate with the examples given below, the process is relatively straightforward once data have been collated, analysed and interpreted.

A threat status is determined by working systematically through the four IUCN Criteria (A, B, C, and D) that are summarised in Table 1 in Section 4.3. A taxon qualifies as threatened (**CR**, **EN**, **VU**) or Near Threatened (**NT**) if one or more of the criteria under A, B, C, or D are met. A taxon can qualify for more than one threat category, in which case the highest level of threat is assigned. If a species does not qualify for a threatened or **NT** status then it is considered to be under no threat and therefore listed as being of Least Concern (**LC**) unless there are insufficient data to assess whether a taxon is threatened or not (Data Deficient or **DD**) or if the taxon has been placed on the waiting list (**WL**) due to uncertainties about taxonomy or native/alien status. Ten examples of how an IUCN threatened status was calculated for the *England Red List* are described below.

7.1 Critically Endangered (CR)

7.1.1 *Phleum alpinum* (Alpine Cat's-tail)

In GB most populations of *Phleum alpinum* grow above 600m in the central uplands of Scotland in damp calcareous grassland, base-rich flushes and grassy slopes, cliff faces and corrie rock ledges (Leach 2002). It is present in 17 GB hectads and is assessed as **LC** for GB (Cheffings & Farrell 2005). However, in England the species is now only known from the Moor House-Upper Teesdale NNR, where it reaches its most southerly location in Britain. *Phleum alpinum* has not been recorded from its only other

historical location in England (Helvellyn) since 1920, and the sole extant English population in Westmorland is very small and vulnerable to increased grazing intensity and rock fall (M. Porter pers. comm.). Although vegetative plants are easily overlooked, detailed surveys over the past 30 years indicate a population of less than 50 plants (F.J. Roberts pers. comm.).

Evaluating the threat status for *Phleum alpinum*:

Criterion A No thresholds met (its hectad decline in England was pre-1930)

Criterion B Although it would qualify as **CR** under this Criterion based on AOO, EOO and number of locations, there has been no appreciable decline since 1930, and so not all thresholds for the Criterion are met

Criterion C No thresholds met for the same reasons as Criterion B

Criterion D Meets the Critically Endangered (**CR**) threshold of a very small or restricted population of <50 mature individuals

The threat assessment for the *England Red List* is therefore **CR** under Criterion D.



Phleum alpinum (Peter Stroh).

7.1.2 *Viola persicifolia* (Fen Violet)

Extensive land drainage and land-use changes led to a catastrophic loss of base-rich fens across eastern England in the 19th and 20th century. Originally known from about 20 locations, *Viola persicifolia* is now only known from three: Otmoor SSSI (where it was rediscovered in 1997), Wicken Fen NNR (rediscovered in 1982) and Woodwalton Fen NNR. Plants have not been recorded from the latter fenland location since 2007 despite intensive searches each year, although seeds are thought to be long-lived in the soil and so may reappear under suitable conditions (Palmer 2006). As if to prove this point, after an absence of c.16 years at Wicken Fen NNR and following disturbance by grazing animals and machinery, 10 flowering *V. persicifolia* plants were recorded in May 2014 along with numerous seedlings in almost exactly the same location where they were last seen in 1998. Scrub removal work in 2011 at the



Viola persicifolia (Peter Stroh).

Otmoor location resulted in an explosion in numbers of flowering individuals in 2012, but hybridisation with *Viola canina* remains a potential threat.

Evaluating the threat status for *Viola persicifolia*:

Criterion A Meets the **CR** threshold of >80% decline in AOO based on Criteria A2c

Criterion B Meets the **EN** thresholds for geographic range with an EOO of ≤5000km² an AOO of ≤500km², ≤5 locations and continuing decline

Criterion C Meets the **CR** threshold by having a total population of <250 individuals, with 90-100% of all individuals in one subpopulation (Criteria C2aii), and evidence of a continuing decline

Criterion D With a population of <100 plants the taxon meets the **EN** threshold

As the highest threat level is assigned, *V. persicifolia* has been assessed as **CR** under criteria A2c; C2aii. It should be noted that *V. persicifolia* is still locally abundant in parts of Ireland.

7.2 Endangered (EN)

7.2.1. *Drosera anglica* (Great Sundew)

This insectivorous perennial of valley bogs, mires, raised peat bogs, blanket bogs and stony lake shores (Rumsey 2002a) is emblematic of the current state of England's flora. It is predominantly a lowland species of extremely infertile, acidic (rarely calcareous) peaty soils that are often saturated. Consequently its habitat is vulnerable to eutrophication, drainage and peat extraction, and populations are often lost because changes in hydrology result in drier conditions which in turn allow the



Drosera anglica (Mark Gurney).

rapid invasion of shrub species that could not persist in saturated soils. It may also be locally threatened by introduced invasive species such as *Sarracenia purpurea* (Walker 2014). Undrained and infertile habitats were once fairly widespread across much of England, but in the period 1930-1999 this species declined in distribution (AOO) by 48% and in range (EOO) by 62%. This taxon is still common across large expanses of northern Scotland and western Ireland. It is assessed as **NT** for GB.

Evaluating the threat status for *Drosera anglica*:

Criterion A Meets the **EN** EOO % decline threshold of $\geq 50\%$ for Criterion A2c and the **VU** AOO % decline threshold of $\geq 30\%$ for Criterion A2c

Criterion B No thresholds met. Although it meets the EN threshold of EOO decline, it is in many more than the minimum number of locations (≤ 5)

Criterion C No thresholds met

Criterion D No thresholds met

The AOO % decline is just outside of the **EN** decline threshold, but an EOO % decline of 62% means that the threat assessment for the *England Red List* for *D. anglica* is **EN** under Criterion A2c.

7.2.2 *Melampyrum cristatum* (Crested Cow-wheat)

This hemiparasitic summer annual is sensitive to changes in management and is suited to unimproved grassland on clay soils (often road verges or green lanes) that are cut in late summer or early autumn, woodland edges and rides on a rotational management regime, and arable field margins. AOO and EOO analysis revealed declines of 60% and 69% respectively, with many losses attributable to the cessation of traditional woodland management, the application and/or drift of broad spectrum herbicides, and the loss of habitat as a result of road-widening. Early cutting when the plant is in flower/seed or the cessation of a cutting regime can rapidly



Melampyrum cristatum (Peter Stroh).

lead to its demise, and seeds are large and unlikely to remain viable for many years in the soil seed-bank. Its seeds have small fleshy structures attached to the seed-casing (elaiosomes) that provide nutrients for ant larvae, and the seeds are therefore thought to be dispersed over short distances by ants. As such, decline is likely to also be linked to landscape fragmentation, the loss of suitable habitat and the absence of any mechanism for long-distance dispersal.

Evaluating the threat status for *Melampyrum cristatum*:

Criterion A Meets the **EN** % decline threshold of $\geq 50\%$ for AOO and EOO

Criterion B No thresholds met for threat status, although the number of locations may soon be < 30 which would equate to **NT** for this Criterion

Criterion C No thresholds met

Criterion D No thresholds met. A comprehensive count of the England population has not been undertaken, but recent surveys (P.A. Stroh *unpublished data*) have estimated a population in excess of 4000 individuals. If the total England population is < 10000 individuals, then the taxon would qualify as **NT** under this Criterion

The GB status for this England-only taxon is currently **VU** based on AOO and EOO decline. The more sensitive model used for analysing AOO trends for this List may be responsible for picking up a greater decline than was apparent for the *GB Red List* and the larger decline of $> 50\%$ is supported by detailed studies from areas where *M. cristatum* was once widespread (e.g. Adams 2008). *Melampyrum cristatum* is therefore assessed for the England List as **EN** based on AOO and EOO decline (Criterion A2c).

7.3 Vulnerable (VU)

7.3.1 *Gentiana verna* (Spring Gentian)

This striking species is one of a small number of arctic-alpine plants that make up the 'Teesdale Assemblage'. It is associated with species-rich calcareous grassland formed over 'sugar limestone' rendzinas, deeper lime-rich boulder clays, the edges of sedge-rich streams and flushes, and limestone outcrops within blanket peat (Hedley 2014a). The England population numbers tens of thousands of individuals. However, evidence from repeat surveys over the past 25 years or more points to a c. 40% decline in population size across the Cumbrian Fells, while declines of c. 30% have been extrapolated from long term monitoring data collated by M.E. Bradshaw covering the period 1968-2012 from the Widdybank area. The decline in numbers is thought to be due to a complex combination of factors that include: i) undergrazing in some areas leading to the development of rank vegetation; ii) an increase in tussock



Gentiana verna (Peter Stroh).

forming rushes; and iii) overgrazing by sheep and, particularly in recent years, rabbits – reducing flowering and fruiting performance and leading to the creation of scrapes and burrows that expose and damage rhizomes. *Gentiana verna* is listed as **LC** on the *GB Red List* because of the reported number of individuals (>10,000), the relatively large core area within which the plant is found, and an absence of published evidence demonstrating a greater than 20% decline in AOO or EOO. The *England Red List* has made use of recently available (as yet unpublished) long-term monitoring data to assess the current status of *G. verna* in England, its threat status being ‘upgraded’ as a result.

Evaluating the threat status for *Gentiana verna*:

Criterion A Meets the **VU** threshold for population reduction (>30% decline based on AOO and/or EOO), based on sub-criteria A2 (a) direct observation and A2 (c) a decline in habitat quality

Criterion B Meets the **VU** threshold for B1 (EOO <5,000 km²); B1a (number of locations ≤ 10); B1b (continuing decline) in (v) number of mature individuals, and B2 (AOO <500 km²); B2a (number of locations ≤10); B2b (continuing decline) in (v) number of mature individuals

Criterion C No thresholds met

Criterion D No thresholds met

Consequently, the taxon qualifies for a **VU** threat status under Criteria A2ac, B1ab(v)+2ab(v). It is hoped that the assessment of *G. verna* as a threatened taxon will result in positive action that prioritises research aimed at assisting future conservation management and continued monitoring at the site level.

7.3.2 *Crepis praemorsa* (Leafless Hawk’s-beard)

As the only location for *Crepis praemorsa* in the British Isles is in England, one might reasonably assume that the *England Red List* threat status would mirror the *GB Red List* status of Endangered (**EN**). However, a detailed survey of the population (Roberts 2009) undertaken since the publication of the *GB Red List* has provided evidence of considerably greater numbers of vegetative plants than recorded in previous surveys. It is likely that the greater number of shoots recorded in the 2009 survey is in part attributable to previous underestimates although Roberts makes clear that in the intervening years there must also have been a genuine and large increase in the number of shoots in some areas within the sole location.



Crepis praemorsa (Jeremy Roberts).

Evaluating the threat status for *Crepis praemorsa*:

Criterion A No thresholds met, as there has been no recorded decline in the population

Criterion B Although present at only one location, Criteria B1b and B2b also state that there must also be continuing decline. The criteria have therefore not been met in full and so the taxon does not qualify under Criterion B

Criterion C The number of mature individuals (c.1775) recorded would meet the **EN** threshold, but there has been no associated continuing decline (required for sub-criterion C2) and so the taxon cannot qualify as threatened under Criterion C

Criterion D There are >1000 but <10,000 mature individuals, and so based on population size the taxon would meet the **NT** threshold. However, as the taxon is known from only one location and there is a plausible future threat linked to over- or under-grazing and bank erosion that could drive the taxon to **CR** or **EX** in a short period of time, it also qualifies as **VU** under Criterion D2

With the highest threat status being applied, *C. praemorsa* qualifies as **VU** under Criterion D2. In effect, the most recent population data have resulted in a change in threatened status for *C. praemorsa* from **EN** under Criterion D (<250 individuals) to **VU** under Criterion D2.

7.4 Near Threatened (NT)

7.4.1 *Herniaria ciliolata* subsp. *ciliolata* (Fringed Rupturewort)

This taxon is found only on the Lizard peninsula in Cornwall, where it grows in a variety of open, south-facing habitats that include coastal cliff slopes, rock outcrops,

heathland and base-rich dune grassland. It may also be encountered on path edges and stone-faced banks (Lusby 2002). It is listed as **VU** in the GB List based on Criterion D2, which equates to the taxon being present in five locations or less and with a plausible threat that could drive the taxon to **CR** or **EX** within a short time. However, the most recent survey data show that it is still extant in every pre-1999 1km square on the Lizard Peninsula (29 in total), and is showing no evidence of decline (Figure 13). Population estimates of mature individuals are extremely difficult for this taxon, but it is likely that numbers would not exceed the **NT** upper threshold figure of 10,000.

Evaluating the threat status for *Herniaria ciliolata* subsp. *ciliolata*:

Criterion A The population is stable, and so no thresholds are met

Criterion B The number of locations is difficult to define but based on 1km² counts the **NT** threshold of ≤30 locations may be met. However, Criterion B also requires continuing decline and as the population is stable, the taxon cannot qualify as **NT**

Criterion C The taxon may have met the **VU** thresholds but Criterion C also requires continuing decline and as the population is stable, the taxon cannot qualify as threatened or **NT**

Criterion D Estimating the number of individuals is problematic due to the growth habit of this taxon. However, it is likely that the **NT** upper threshold of 10,000 'mature individuals' is not exceeded, and so the taxon does meet the **NT** based on a very small or restricted population. There are certainly >5 locations, and as such the taxon does not meet **VU** D2 criteria

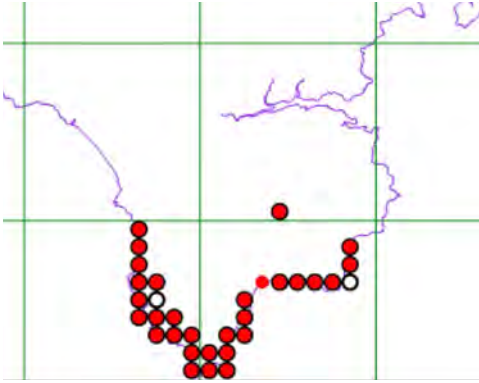


Figure 13: The distribution of *Herniaria ciliolata* subsp. *ciliolata* at the Lizard peninsula, Cornwall (coastline in purple; green squares represent hectads). Red dots with black outline indicate a pre-1999 record that has been relocated post-1999 to monad resolution. Empty circles represent new locations, and the sole red dot without a black outline indicates an unconfirmed record from the 1950s. Figure drawn by Colin French using data contained in the ERICA database.

Herniaria ciliolata subsp. *ciliolata* is cautiously assessed as **NT** based on the number of mature individuals. The GB status of **VU D2** is currently still valid, although as an England-only taxon this status will need to be reviewed based on the most recent evidence.

7.4.2 *Koeleria vallesiana* (Somerset Hair-grass)

Koeleria vallesiana is a drought-tolerant grass of short turf and rocky limestone ledges and outcrops. It is restricted to a small number of locations in S.W. England and reaches the absolute northern limit of its European range at the western end of the Mendip Hills in North Somerset (Preston 2007; Cope & Gray 2009). The species was assessed as **VU** for the GB List based on Criterion D2, but distribution data compiled for the *England Red List* indicates there are at least ten distinct extant locations across four hectads. Estimating the number of mature individuals

is problematic and time-consuming, but a conservative estimate based on local expert opinion (H.J. Crouch pers. comm.) gives a population of less than 10,000 plants.

Evaluating the threat status for *Koeleria vallesiana*:

Criterion A The distribution of *K. vallesiana* is stable and so no decline thresholds are met

Criterion B Although this taxon has an AOO <2000km² and is present in ≤10 locations, there is no evidence of a 'continuing decline' and so it cannot qualify under Criterion B

Criterion C There is no 'continuing decline' and so *K. vallesiana* cannot qualify under Criterion C

Criterion D Meets the **NT** threshold for the number of mature individuals (≤10,000) but cannot qualify as **VU D2** as >5 locations are recognised



Koeleria vallesiana (Fred Rumsey).

Koeleria vallesiana is therefore assessed as **NT** under Criterion D. The GB status of **VU D2** is still valid, although as an England-only taxon the GB status will need to be reviewed based on the most recent evidence.

7.5 Least Concern (LC)

7.5.1 *Centaurium tenuiflorum* (Slender Centaury)

In England this rare annual is found on freely-draining sandy or clayey soils within slumping cliff habitat at five locations along the Dorset coast where it reaches its northern range limit in Europe (Pearman 1999; Porley 2002). The taxon will not persist within a closed sward; it is an opportunist dependant on the periodic disturbance of ‘undercliff’ habitat, the creation of open ground, and the subsequent flowering and setting of abundant seed that can persist in the soil until the next disturbance event. The most recent population estimate is of hundreds of thousands of plants and there is no reason to suppose that further land slippage will not take place. This England-only taxon was assessed as **VU D2** for the *GB Red List*.

Evaluating the threat status for *Centaurium tenuiflorum*:

Criterion A The population is considered to be stable and so no thresholds are met

Criterion B The population is considered to be stable and so no thresholds are met. If a real decline is established in future assessments, then the **VU** threshold under this Criterion would be met

Criterion C No continuing decline has been recorded and the population far exceeds the threat threshold

Criterion D The population far exceeds 10,000 individuals and so cannot qualify for **NT** status under this Criterion. The number of locations means that the taxon would qualify for a **VU D2** threat status, but there is no plausible future threat that would lead to the taxon becoming **CR** or **EX** within a short time

Centaurium tenuiflorum is therefore assessed as **LC** because it does not meet any of the



Slumping cliff habitat of Centaurium tenuiflorum (Clive Chatters).

IUCN threat (or **NT**) Criteria thresholds. The GB status of **VU D2** is currently still valid, although as an England-only taxon this status will be reviewed based on the most recent evidence in due course.

7.5.2 *Saxifraga hirculus* (Marsh Saxifrage)

Saxifraga hirculus is a perennial herb that occurs in high-level, closed, base-rich flushes and mires, with the bulk of the English population found in the north Pennines. Plants produce a shortly creeping rhizome in the growing season, with shoots dying back in September to resting buds just below the soil surface. The following spring flowering shoots and numerous leafy stolons are produced (Hedley 2014b). Plants often remain in a vegetative state, with shyness of flowering probably a reflection of preferential over-grazing of the habitat, although as a secondary factor there is also evidence that flowering is influenced by changes in mire chemistry (Ohlson 1986; Roberts 2010). Huge numbers of vegetative shoots may occur within suitable habitat, with the north Pennines population estimated at c. 450, 000 ramets (Roberts 2010) across 13 extant locations (with multiple sub-populations present within each location), including two new locations for *S. hirculus* found in the past two years (Robinson 2014). The English population of *S. hirculus* represents the GB stronghold for this

species, with the GB threat status of **VU A2c** largely based on declines in lowland Scotland. As mentioned in Section 1, the GB status is still applicable for the England population, as this status recognises the importance of the English population should further losses occur in Scotland or Northern Ireland.

Evaluating the threat status for *Saxifraga hirculus*:

Criterion A No substantial (e.g. >20%) decline detected, and so no thresholds met for this Criterion

Criterion B *Saxifraga hirculus* is present in too many locations to qualify for a threatened status. The taxon would qualify for the **NT** threshold of <30 locations, but there is not a continuing decline in the English population

Criterion C The number of individuals in the English population far exceeds the threshold for **NT**

Criterion D The number of individuals and locations far exceeds threatened or **NT** thresholds

S. hirculus is therefore assessed as **LC** because it does not meet any of the IUCN threat (or **NT**) Criteria thresholds.



Saxifraga hirculus (Jeremy Roberts).

8 Vascular Plant Red List for England

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Acer campestre</i>	LC								
EX	<i>Achillea maritima</i> (<i>Otanthus maritimus</i>)	EX					N2			
LC	<i>Achillea millefolium</i>	LC								
LC	<i>Achillea ptarmica</i>	LC								
WL	<i>Aconitum napellus</i>	WL					N2			
LC	<i>Actaea spicata</i>	LC								
LC	<i>Adiantum capillus-veneris</i>	LC					N2			
EN	<i>Adonis annua</i>	EN	A2c AOO and EOO trend	67	66					
LC	<i>Adoxa moschatellina</i>	LC								
LC	<i>Aegopodium podagraria</i>	LC								
LC	<i>Aethusa cynapium</i>	LC								
WL	<i>Aethusa cynapium</i> subsp. <i>agrestis</i>	WL								
LC	<i>Aethusa cynapium</i> subsp. <i>cynapium</i>	LC								
LC	<i>Agrimonia eupatoria</i>	LC								
LC	<i>Agrimonia procera</i>	LC								
WL	<i>Agrostemma githago</i>	WL								
LC	<i>Agrostis canina</i>	LC								
LC	<i>Agrostis capillaris</i>	LC								
LC	<i>Agrostis curtisii</i>	LC								
LC	<i>Agrostis gigantea</i>	LC								
LC	<i>Agrostis stolonifera</i>	LC								
LC	<i>Agrostis vinealis</i>	LC								
LC	<i>Aira caryophyllea</i>	LC								
LC	<i>Aira praecox</i>	LC								
EN	<i>Ajuga chamaepitys</i>	EN	A2c AOO and EOO trend	58	79			N2		
VU	<i>Ajuga pyramidalis</i>	CR	D			1	18			
LC	<i>Ajuga reptans</i>	LC								
VU	<i>Alchemilla acutiloba</i>	VU	A2a AOO trend	47						
LC	<i>Alchemilla alpina</i>	LC								
LC	<i>Alchemilla filicaulis</i>	LC								
LC	<i>Alchemilla filicaulis</i> subsp. <i>filicaulis</i>	DD								

International responsibility?	Proportion (%) of GB hectads in England	Native _archaeophyte	Comments
	91		Last record on the Scilly Isles in 1936.
	100		The putative native form (subsp. <i>napellus</i>) was first discovered in 1821. Garden forms are widely planted and frequently escape. Further taxonomic studies are required.
	98	Arch	
		Arch	
	85		Native or alien. Native or alien. Insufficient mapping data.
			Native or alien. Assumed LC as species.
	79		
	89	Arch	This species was believed extinct as an archaeophyte, and its recent reappearance is most likely due to its popularity in 'wild flower' seed mixes, for which the origin is not the UK. However, it is possible that some occurrences may have resulted from long-buried UK seed sources. If genetic markers can be found that can distinguish UK material from long-established populations, this could be resolved.
	93		
	78	Arch	
	100		
	2		Recent counts have recorded only 18 mature individuals, although the two sub-populations are thought to be stable.
	100		Decline based on data summarised in Bradshaw (2009).
	5		
			Insufficient distribution data.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Alchemilla filicaulis</i> subsp. <i>vestita</i>	LC								
LC	<i>Alchemilla glabra</i>	LC								
LC	<i>Alchemilla glaucescens</i>	LC								
VU	<i>Alchemilla glomerulans</i>	EN	A2c AOO trend	>50						
EN	<i>Alchemilla micans</i>	EN	B1ab(v) + 2ab(v); C2a(i)		4					
EN	<i>Alchemilla monticola</i>	EN	A2c AOO trend	75						
EN	<i>Alchemilla subcrenata</i>	EN	A2c AOO trend	53						
EN	<i>Alchemilla wichurae</i>	VU	A2c AOO trend	44						
LC	<i>Alchemilla xanthochlora</i>	LC								
CR	<i>Alisma gramineum</i>	CR	C2a(ii) + 2b							
LC	<i>Alisma lanceolatum</i>	LC								
LC	<i>Alisma plantago-aquatica</i>	LC								
LC	<i>Alliaria petiolata</i>	LC								
LC	<i>Allium ampeloprasum</i>	LC								
VU	<i>Allium oleraceum</i>	LC								
LC	<i>Allium schoenoprasum</i>	LC								
LC	<i>Allium scorodoprasum</i>	LC								
VU	<i>Allium sphaerocephalon</i>	VU	D1; D2		1	168	N2			
LC	<i>Allium ursinum</i>	LC								
LC	<i>Allium vineale</i>	LC								
LC	<i>Alnus glutinosa</i>	LC								
LC	<i>Alopecurus aequalis</i>	LC								
LC	<i>Alopecurus bulbosus</i> (<i>Alopecurus borealis</i>)	LC								
LC	<i>Alopecurus geniculatus</i>	LC								
LC	<i>Alopecurus magellanicus</i>	NT	D		4	<10000	S2			
LC	<i>Alopecurus myosuroides</i>	LC								
LC	<i>Alopecurus pratensis</i>	LC								
LC	<i>Althaea officinalis</i>	NT	A2c AOO trend	27						
LC	<i>Ammophila arenaria</i>	LC								
NT	<i>Anacamptis morio</i> (<i>Orchis morio</i>)	VU	A2c AOO trend	32						
LC	<i>Anacamptis pyramidalis</i>	LC								
LC	<i>Anagallis arvensis</i>	LC								
LC	<i>Anagallis arvensis</i> subsp. <i>arvensis</i>	LC								
LC	<i>Anagallis arvensis</i> subsp. <i>foemina</i>	DD								
LC	<i>Anagallis tenella</i>	LC								

International responsibility?
 Proportion (%) of GB hecctads in England
 Native_archaeophyte

Comments

Assumed LC as species.

	75		
	100		Decline is based on data summarised in Bradshaw (2009) and analysis of distribution data.
	100		Decline based on data summarised in Bradshaw (2009).
	100		Decline based on data summarised in Bradshaw (2009).
	100		Decline based on data summarised in Bradshaw (2009).
			Decline based on data summarised in Bradshaw (2009).
	100		This taxon may also qualify for CR based on Criterion D1 (number of mature individuals <50). Urgent action is required.
	93		LC for the period 1930-1999 but a 31% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	75		
	93	Arch	
	94		LC for the period 1930-1999 but a 41% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			LC for the period 1930-1999 but a 31% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		Population estimate based on field data collected in 2010 (L. Houston pers. comm.).
	78		
	94		LC for the period 1930-1999 but a 42% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	80		LC for the period 1930-1999 but a 44% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			Threat status based on a population estimate of >1,000 but <10,000 mature individuals.
	92	Arch	
	79		
	88		
	88		
	78		Assumed LC as species.
			A comparison between the two time periods was complicated by the separate mapping of subsp. <i>foemina</i> and forma <i>azurea</i> in the first time period but not the second. It is possible that this taxon has declined due to more intensive use of arable margins.
			LC for the period 1930-1999 but a 30% decline was detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Anchusa arvensis</i>	LC								
LC	<i>Andromeda polifolia</i>	NT	A2c EOO trend		21					
LC	<i>Anemone nemorosa</i>	LC								
LC	<i>Angelica sylvestris</i>	LC								
LC	<i>Anisantha sterilis</i>	LC								
LC	<i>Antennaria dioica</i>	VU	A2c AOO and EOO trend	36	33					
EN	<i>Anthemis arvensis</i>	EN	A2c AOO trend	52						
VU	<i>Anthemis cotula</i>	VU	A2c AOO trend	44						
LC	<i>Anthoxanthum odoratum</i>	LC								
LC	<i>Anthriscus caucalis</i>	LC								
LC	<i>Anthriscus sylvestris</i>	LC								
LC	<i>Anthyllis vulneraria</i>	LC								
WL	<i>Anthyllis vulneraria</i> subsp. <i>corbierei</i>	WL								
WL	<i>Anthyllis vulneraria</i> subsp. <i>lapponica</i>	WL								
LC	<i>Anthyllis vulneraria</i> subsp. <i>vulneraria</i>	LC								
NT	<i>Apera spica-venti</i>	LC								
LC	<i>Aphanes arvensis</i>	LC								
LC	<i>Aphanes arvensis</i> agg.	LC								
LC	<i>Aphanes australis</i>	LC								
LC	<i>Apium graveolens</i>	LC								
LC	<i>Apium inundatum</i>	VU	A2c AOO and EOO trend	37	49					
LC	<i>Apium nodiflorum</i>	LC								
VU	<i>Apium repens</i>	EN	B2ab(iv) + 2c(iv)			2	100s - 1000s			
LC	<i>Aquilegia vulgaris</i>	LC								
LC	<i>Arabidopsis thaliana</i>	LC								
LC	<i>Arabis hirsuta</i>	NT	A2c AOO and EOO trend	27	28					
VU	<i>Arabis scabra</i>	VU	D2				3750	N2		
LC	<i>Arctium lappa</i>	LC								
LC	<i>Arctium minus</i>	LC								
LC	<i>Arctium minus</i> subsp. <i>minus</i>	LC								
LC	<i>Arctium minus</i> subsp. <i>pubens</i>	LC								
LC	<i>Arctostaphylos uva-ursi</i>	NT	B			<20				
LC	<i>Arenaria leptoclados</i> (<i>Arenaria serpyllifolia</i> subsp. <i>leptoclados</i>)	LC								

International responsibility?	Proportion (%) of GB hectads in England	Native/archaeophyte	Comments
		Arch	
		Arch	
	10		
	88	Arch	
	94	Arch	
	88		LC for the period 1930-1999 but a 30% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			Stace (2010) suggests that this taxon is possibly only a variety of subsp. <i>vulneraria</i> .
			Insufficient mapping data.
			Assumed LC as species.
	96	Arch	LC for the period 1930-1999 but a 44% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	87		The sole native subspecies is <i>Apium graveolens</i> subsp. <i>graveolens</i> . LC for the period 1930-1999, but a 35% decline detected when assessing 1987+ data as a proportion of all records, including pre-1930 data. See Section 6.7.
	82		
	100		Lost from two Oxfordshire locations and not seen at a third for c.10 years, although plants may reappear from the seed bank under suitable conditions.
	100		Population estimate is based on the number of rosettes from field data collected in 2010 (L. Houston pers. comm.).
	92	Arch	
			Assumed LC as species.
			Assumed LC as species.
	2		
	83		LC for the period 1930-1999 but a 30% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
EN	<i>Arenaria norvegica</i> subsp. <i>anglica</i>	EN	C2a(i)			c.730		Yes		
LC	<i>Arenaria serpyllifolia</i>	LC								
LC	<i>Arenaria serpyllifolia</i> s.l.	LC								
WL	<i>Arenaria serpyllifolia</i> subsp. <i>lloydii</i>	WL								
LC	<i>Arenaria serpyllifolia</i> subsp. <i>serpyllifolia</i>	LC								
LC	<i>Armeria maritima</i>	LC								
CR	<i>Armeria maritima</i> subsp. <i>elongata</i>	CR	A2c AOO trend	83	2	c.100				
LC	<i>Armeria maritima</i> subsp. <i>maritima</i>	LC								
LC	<i>Armoracia rusticana</i>	LC								
EX	<i>Arnoseris minima</i>	EX								
LC	<i>Arrhenatherum elatius</i>	LC								
LC	<i>Artemisia absinthium</i>	LC								
VU	<i>Artemisia campestris</i>	EN	A2c AOO trend; C2a(ii)							
VU	<i>Artemisia campestris</i> subsp. <i>campestris</i>	EN	A2c AOO trend; C2a(ii)	74	2					
WL	<i>Artemisia campestris</i> subsp. <i>maritima</i>	WL								
LC	<i>Artemisia maritima</i> (<i>Seriphidium maritimum</i>)	NT	A2c AOO trend	28						
LC	<i>Artemisia vulgaris</i>	LC								
NT	<i>Arum italicum</i>	LC								
LC	<i>Arum maculatum</i>	LC								
LC	<i>Asparagus officinalis</i> subsp. <i>officinalis</i>	LC								
EN	<i>Asparagus prostratus</i> (<i>Asparagus officinalis</i> subsp. <i>prostratus</i>)	VU	D1			c.1300				
LC	<i>Asperula cynanchica</i>	LC					N2			
LC	<i>Asplenium adiantum-nigrum</i>	LC								
LC	<i>Asplenium ceterach</i> (<i>Ceterach officinarum</i>)	LC								
EX	<i>Asplenium fontanum</i>	EX								
LC	<i>Asplenium marinum</i>	LC								
NT	<i>Asplenium obovatum</i>	NT	A2c AOO trend	29						
LC	<i>Asplenium ruta-muraria</i>	LC								
LC	<i>Asplenium scolopendrium</i> (<i>Phyllitis scolopendrium</i>)	LC								
NT	<i>Asplenium septentrionale</i>	VU	D1			<1000				
LC	<i>Asplenium trichomanes</i>	LC								
NT	<i>Asplenium trichomanes</i> subsp. <i>pachyrachis</i>	NT	D			<10000				

International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
yes	100		The sole subspecies in England is <i>Arenaria norvegica</i> subsp. <i>anglica</i> . The most recent population estimate is from 2012 (K. Walker pers. comm.).
			Insufficient mapping data. Accepted as a subspecies in Flora Nordica (Jonsell 2001), and considered a distinct dune ecotype in Stace (2010). Assumed LC as species.
	100		Population estimate is from 2013 (P. Kirby pers. comm.).
			Assumed LC as species.
	87	Arch	
		Arch	Last recorded in Buckinghamshire in 1972.
	79	Arch	LC for the period 1930-1999 but a 39% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		One of the two extant locations is a long-term introduction initiated in the 1960s. Native or alien.
possibly			
		Arch	
	98		The sole native subspecies is <i>Arum italicum</i> subsp. <i>neglectum</i> .
	86		
		Arch	Assumed LC as species.
			The most recent count for this taxon exceeds the VU threshold for Criterion D. However, past counts within the last 20 years have estimated <1000 individuals.
	93		
			Last recorded in North Hampshire in 1869.
			A confidence level of 90% was accepted for the AOO trend.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Asplenium trichomanes</i> subsp. <i>quadrivalens</i>	LC								
LC	<i>Asplenium trichomanes</i> subsp. <i>trichomanes</i>	LC								
LC	<i>Asplenium viride</i>	LC								
LC	<i>Aster linosyris</i>	EN	B1ab(i-v) + 2ab(i-v)		3					
LC	<i>Aster tripolium</i>	LC								
EN	<i>Astragalus danicus</i>	EN	A2c EOO trend	61						
LC	<i>Astragalus glycyphyllos</i>	LC								
LC	<i>Athyrium filix-femina</i>	LC								
LC	<i>Atriplex glabriuscula</i>	LC								
LC	<i>Atriplex laciniata</i>	LC								
LC	<i>Atriplex littoralis</i>	LC								
LC	<i>Atriplex longipes</i>	LC					S2			
LC	<i>Atriplex patula</i>	LC								
CR	<i>Atriplex pedunculata</i>	CR	B1ab(v)+ 2ab(v); C2a(ii)		1	120				
LC	<i>Atriplex portulacoides</i>	LC								
LC	<i>Atriplex praecox</i>	CR	C2a(i)		1					
LC	<i>Atriplex prostrata</i>	LC								
LC	<i>Atropa belladonna</i>	LC								
LC	<i>Avena fatua</i>	LC								
LC	<i>Avenula pratensis</i> (<i>Helictotrichon pratense</i>)	LC								
LC	<i>Avenula pubescens</i> (<i>Helictotrichon pubescens</i>)	LC								
NT	<i>Baldellia ranunculoides</i>	VU	A2c AOO trend	43						
LC	<i>Ballota nigra</i>	LC								
LC	<i>Barbarea vulgaris</i>	LC								
LC	<i>Bartsia alpina</i>	VU	D1			<1000				
LC	<i>Bellis perennis</i>	LC								
LC	<i>Berberis vulgaris</i>	LC								
LC	<i>Berula erecta</i>	LC								
LC	<i>Beta vulgaris</i>	LC								
LC	<i>Betonica officinalis</i> (<i>Stachys officinalis</i>)	LC								
LC	<i>Betula nana</i>	CR	D		3	<50				
LC	<i>Betula pendula</i>	LC								
LC	<i>Betula pubescens</i>	LC								
WL	<i>Betula pubescens</i> subsp. <i>pubescens</i>	WL								
WL	<i>Betula pubescens</i> subsp. <i>tortuosa</i>	WL								

International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
			Assumed LC as species.
			Assumed LC as species.
	87		LC for the period 1930-1999 but a 38% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		Two recently introduced populations are excluded from the analysis. the population estimate is based on the latest count in 2013 (S.J. Leach 2013).
	78		The species has not been recorded from a second location in Northumberland since 1990.
	99		LC for the period 1930-1999 but a 34% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	82	Arch	
possibly			The sole native subspecies recorded in England is <i>Baldellia ranunculooides</i> subsp. <i>ranunculooides</i> , although it is possible that subsp. <i>repens</i> is present but currently overlooked
	91	Arch	
	77		
	77		Native or alien. LC for the period 1930-1999 but a 39% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	85		
			The sole native subspecies in England is <i>Beta vulgaris</i> subsp. <i>maritima</i> .
	82		
	2		
			Insufficient mapping data. This subspecies is included in both Stace (2010) and Flora Europaea, but not in Flora Nordica.
			Insufficient mapping data. This subspecies is included in both Stace (2010) and Flora Europaea, but not in Flora Nordica.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Bidens cernua</i>	LC								
LC	<i>Bidens tripartita</i>	LC								
LC	<i>Blackstonia perfoliata</i>	LC					N3			
LC	<i>Blechnum spicant</i>	LC								
VU	<i>Blysmus compressus</i>	VU	A2c AOO trend	34						
LC	<i>Blysmus rufus</i>	NT	A2c EOO trend	25						
LC	<i>Bolboschoenus laticarpus</i>	LC								
LC	<i>Bolboschoenus maritimus</i>	LC								
LC	<i>Botrychium lunaria</i>	VU	A2c AOO trend	31						
LC	<i>Brachypodium pinnatum</i> s.l.	LC								
LC	<i>Brachypodium pinnatum</i> s.s.	LC								
WL	<i>Brachypodium rupestre</i> (<i>Brachypodium pinnatum</i> subsp. <i>rupestre</i>)	WL								
LC	<i>Brachypodium sylvaticum</i>	LC								
LC	<i>Brassica nigra</i>	LC								
LC	<i>Brassica oleracea</i>	LC								
LC	<i>Brassica rapa</i>	LC								
LC	<i>Briza media</i>	NT	A2c AOO trend	25						
LC	<i>Briza minor</i>	LC								
LC	<i>Bromopsis benekenii</i>	LC								
LC	<i>Bromopsis erecta</i>	LC					N2			
LC	<i>Bromopsis ramosa</i>	LC								
LC	<i>Bromus commutatus</i>	LC								
LC	<i>Bromus hordeaceus</i>	LC								
LC	<i>Bromus hordeaceus</i> subsp. <i>feronii</i>	LC								
LC	<i>Bromus hordeaceus</i> subsp. <i>hordeaceus</i>	LC								
WL	<i>Bromus hordeaceus</i> subsp. <i>longipedicellatus</i>	WL								
LC	<i>Bromus hordeaceus</i> subsp. <i>thominei</i>	LC								
EW	<i>Bromus interruptus</i>	EW						yes		
LC	<i>Bromus racemosus</i>	LC								
VU	<i>Bromus secalinus</i>	NT	A2c EOO trend	27						
LC	<i>Bryonia dioica</i>	LC								
LC	<i>Bunium bulbocastanum</i>	LC								
VU	<i>Bupleurum baldense</i>	EN	D			2	c.200	N2		
CR	<i>Bupleurum rotundifolium</i>	CR	A2c AOO and EOO trend	86	93					
VU	<i>Bupleurum tenuissimum</i>	VU	A2c AOO trend	41						
LC	<i>Butomus umbellatus</i>	LC								

International responsibility?	Proportion (%) of GB hecads in England	Native_archaeophyte	Comments
	85		
	85		
	92		
	91		
	7		
			Lost from many lowland sites.
			Assumed LC as <i>B. pinnatum</i> s.l. Insufficient mapping data. The distinction between this and <i>B. pinnatum</i> was not found until after the publication of the New Atlas.
	88		
yes			
		Arch	The sole archaeophyte subspecies in England is <i>Brassica rapa</i> subsp. <i>campestris</i> . The measured decline in occupancy of 24% for this species reflects the loss of lowland unimproved grassland in England within the same time period. See Section 6.8 for more information.
	97	Arch	LC for the period 1930-1999 but a 33% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	97		
			Assumed LC as species.
			Insufficient mapping data. Described after the publication of the New Atlas. It may be a neophyte, but the UK may also have the only remaining populations in the world. Assumed LC as species.
yes			Re-introduced to a former introduction location in autumn 2013, following three failed introduction attempts in the previous decade.
	88		LC for the period 1930-1999 but a 30% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	95	Arch	
	97		
	100		
	100		
	94	Arch	
	92		
	96		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
DD	<i>Buxus sempervirens</i>	DD								
LC	<i>Cakile maritima</i>	LC								
LC	<i>Calamagrostis canescens</i>	LC								
LC	<i>Calamagrostis epigejos</i>	LC								
LC	<i>Calamagrostis purpurea</i>	VU	D2			3				
VU	<i>Calamagrostis stricta</i>	VU	D2			5				
LC	<i>Callitriche brutia</i> (<i>Callitriche hamulata</i> s.l.)	LC								
LC	<i>Callitriche brutia</i> subsp. <i>brutia</i> (<i>Callitriche brutia</i>)	LC								
LC	<i>Callitriche brutia</i> subsp. <i>hamulata</i> (<i>Callitriche hamulata</i> s.l.)	LC								
LC	<i>Callitriche hermaphroditica</i>	LC								
LC	<i>Callitriche obtusangula</i>	LC								
LC	<i>Callitriche platycarpa</i>	LC								
LC	<i>Callitriche stagnalis</i>	LC								
LC	<i>Callitriche truncata</i>	LC					N2			
LC	<i>Calluna vulgaris</i>	NT	A2c AOO trend	21						
LC	<i>Caltha palustris</i>	LC								
LC	<i>Calystegia sepium</i>	LC								
LC	<i>Calystegia sepium</i> subsp. <i>roseata</i>	LC								
LC	<i>Calystegia sepium</i> subsp. <i>sepium</i>	LC								
LC	<i>Calystegia soldanella</i>	VU	A2c AOO trend	30						
LC	<i>Camelina sativa</i>	LC								
LC	<i>Campanula glomerata</i>	LC								
LC	<i>Campanula latifolia</i>	LC								
EN	<i>Campanula patula</i>	CR	C2a(i)			<250				
EN	<i>Campanula rapunculus</i>	EN	A2c AOO trend	55						
LC	<i>Campanula rotundifolia</i>	NT	A2c AOO trend	23						
LC	<i>Campanula rotundifolia</i> subsp. <i>montana</i>	NT								
LC	<i>Campanula rotundifolia</i> subsp. <i>rotundifolia</i>	DD								
LC	<i>Campanula trachelium</i>	LC								
LC	<i>Capsella bursa-pastoris</i>	LC								
LC	<i>Cardamine amara</i>	LC								
LC	<i>Cardamine bulbifera</i>	LC								
LC	<i>Cardamine flexuosa</i>	LC								

International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
	100		
	95		LC for the period 1930-1999 but a 34% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	89		
			Assumed LC as species.
			Assumed LC as species.
	85		
	76		
	95		
			Although a surprising result, the measured decline in occupancy of c.21% for this species reflects the catastrophic loss of lowland heathland in England within the same time period. See Section 6.8 for more information.
			Assumed LC as species.
			Assumed LC as species.
	93	Arch	LC for the period 1930-1999 but a 66% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	96		LC for the period 1930-1999 but a 32% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	90		Recent surveys by the National Botanic Gardens of Wales estimated a population in England not exceeding 250 mature individuals.
	85	Arch	<i>C. rotundifolia</i> is a poor competitor with vigorous grasses, and Stevens <i>et al.</i> (2011) found that this species was strongly negatively associated with Nitrogen deposition.
			Assumed NT as species.
	95		
		Arch	
	100		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Cardamine hirsuta</i>	LC								
NT	<i>Cardamine impatiens</i>	LC								
LC	<i>Cardamine pratensis</i>	LC								
LC	<i>Carduus crispus</i>	LC								
LC	<i>Carduus nutans</i>	LC								
LC	<i>Carduus tenuiflorus</i>	LC								
LC	<i>Carex acuta</i>	LC								
LC	<i>Carex acutiformis</i>	LC								
NT	<i>Carex appropinquata</i>	LC								
LC	<i>Carex aquatilis</i>	LC								
LC	<i>Carex arenaria</i>	LC								
LC	<i>Carex atrata</i>	EN	D			4	<100			
LC	<i>Carex bigelowii</i>	LC								
LC	<i>Carex binervis</i>	LC								
LC	<i>Carex canescens</i> (<i>Carex curta</i>)	LC								
LC	<i>Carex capillaris</i>	LC								
LC	<i>Carex caryophyllea</i>	LC								
CR	<i>Carex cespitosa</i>	CR	D			1	c.50			
EX	<i>Carex davalliana</i>	EX								
LC	<i>Carex demissa</i> (<i>Carex viridula</i> subsp. <i>oedocarpa</i>)	LC								
EN	<i>Carex depauperata</i>	EN	D			2	c.63			
NT	<i>Carex diandra</i>	VU	A2c AOO trend	34						
LC	<i>Carex digitata</i>	LC								
LC	<i>Carex dioica</i>	LC								
LC	<i>Carex distans</i>	LC								
LC	<i>Carex disticha</i>	LC								
VU	<i>Carex divisa</i>	LC								
LC	<i>Carex divulsa</i>	LC								
LC	<i>Carex divulsa</i> subsp. <i>divulsa</i>	LC								
LC	<i>Carex divulsa</i> subsp. <i>leersii</i>	LC								
LC	<i>Carex echinata</i>	NT	A2c AOO trend	29						
LC	<i>Carex elata</i>	NT	A2c EOO trend		29					
LC	<i>Carex elongata</i>	NT	A2c EOO trend		27					
VU	<i>Carex ericetorum</i>	VU	A2c EOO trend		33					
LC	<i>Carex extensa</i>	LC								
LC	<i>Carex filiformis</i>	LC								
LC	<i>Carex flacca</i>	LC								

International responsibility?
 Proportion (%) of GB hectads in England
 Native __archaeophyte

Comments

	85		LC for the period 1930-1999 but a 49% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	85		
	90		
	89		LC for the period 1930-1999 but a 36% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	80		
	84		LC for the period 1930-1999 but a 44% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	5		
	5		
	9		
			LC for the period 1930-1999 but a 32% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		A recent addition to the GB Flora (James 2012).
	100		
	100		LC for the period 1930-1999 but a 31% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			LC for the period 1930-1999 but a 42% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			LC for the period 1930-1999 but a 31% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	97		LC for the period 1930-1999 but a 40% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	92		
	89		
	77		
	100		
	100		LC for the period 1930-1999 but a 33% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
VU	<i>Carex flava</i>	VU	D2			2				
LC	<i>Carex hirta</i>	LC								
LC	<i>Carex hostiana</i>	LC								
LC	<i>Carex humilis</i>	LC								
LC	<i>Carex laevigata</i>	LC								
LC	<i>Carex lasiocarpa</i>	VU	A2c EOO trend	48						
LC	<i>Carex lepidocarpa</i> (<i>Carex viridula</i> subsp. <i>brachyrrhyncha</i>)	LC								
LC	<i>Carex leporina</i> (<i>Carex ovalis</i>)	LC								
LC	<i>Carex limosa</i>	EN	A2c EOO trend	65						
LC	<i>Carex magellanica</i>	NT	A2c EOO trend	22						
EN	<i>Carex maritima</i>	RE								
LC	<i>Carex montana</i>	LC								
LC	<i>Carex muricata</i>	LC								
NT	<i>Carex muricata</i> subsp. <i>muricata</i>	NT	D			<10000				
LC	<i>Carex muricata</i> subsp. <i>pairae</i> (<i>Carex muricata</i> subsp. <i>lamprocarpa</i>)	LC								
LC	<i>Carex nigra</i>	LC								
LC	<i>Carex oederi</i> (<i>Carex viridula</i> subsp. <i>viridula</i>)	LC								
LC	<i>Carex ornithopoda</i>	LC								
LC	<i>Carex otrubae</i>	LC								
LC	<i>Carex pallescens</i>	LC								
LC	<i>Carex panicea</i>	LC								
LC	<i>Carex paniculata</i>	LC								
LC	<i>Carex pauciflora</i>	NT	B; D		14?	<10000				
LC	<i>Carex pendula</i>	LC								
LC	<i>Carex pilulifera</i>	LC								
LC	<i>Carex pseudocyperus</i>	LC								
LC	<i>Carex pulicaris</i>	NT	A2c AOO trend	24						
LC	<i>Carex punctata</i>	LC								
LC	<i>Carex remota</i>	LC								
LC	<i>Carex riparia</i>	LC								
LC	<i>Carex rostrata</i>	LC								
LC	<i>Carex spicata</i>	LC								
LC	<i>Carex strigosa</i>	LC								
LC	<i>Carex sylvatica</i>	LC								
EX	<i>Carex trinervis</i>	EX								
LC	<i>Carex vaginata</i>	LC								
LC	<i>Carex vesicaria</i>	VU	A2c AOO trend	34						
VU	<i>Carex vulpina</i>	VU	A2c AOO trend	47						

International responsibility?	Proportion (%) of GB hectads in England	Native_archaeophyte	Comments
	100		
	100		
	7		Searched for on numerous occasions but not recorded since 1994.
	100		LC for the period 1930-1999 but a 30% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	4		Absent from England south of Cumbria. A repeat survey of several locations in the late 1990s failed to reveal any plants, although it is an inconspicuous species. Targeted surveys of all England sites is desirable.
	81		
	95		
possibly			
	88		
	90		
possibly	94		
	5		
	100		

A Vascular Plant Red List for England

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Carlina vulgaris</i>	NT	A2c AOO trend	25						
LC	<i>Carpinus betulus</i>	LC								
EN	<i>Carum carvi</i>	CR	A2c AOO trend	34						
LC	<i>Carum verticillatum</i>	VU	A2c AOO trend	40						
LC	<i>Castanea sativa</i>	LC								
LC	<i>Catabrosa aquatica</i>	VU	A2c EOO trend		41					
LC	<i>Catapodium marinum</i>	LC								
LC	<i>Catapodium rigidum</i>	LC								
WL	<i>Catapodium rigidum</i> subsp. <i>majus</i>	WL								
LC	<i>Catapodium rigidum</i> subsp. <i>rigidum</i>	LC								
EX	<i>Caulis platycarpus</i>	EX								
CR	<i>Centaurea calcitrapa</i>	EN	A2c AOO trend	75						
LC	<i>Centaurea cyanus</i>	LC								
LC	<i>Centaurea debeauxii</i>	LC								
WL	<i>Centaurea debeauxii</i> subsp. <i>nemoralis</i>	WL								
WL	<i>Centaurea debeauxii</i> subsp. <i>thuillieri</i>	WL								
LC	<i>Centaurea nigra</i>	LC								
LC	<i>Centaurea nigra</i> agg.	LC								
LC	<i>Centaurea scabiosa</i>	LC								
LC	<i>Centaureum erythraea</i>	LC								
LC	<i>Centaureum littorale</i>	LC								
LC	<i>Centaureum pulchellum</i>	LC								
EN	<i>Centaureum scilloides</i>	EN	D				200			
VU	<i>Centaureum tenuiflorum</i>	LC				5	>100000	N2		
NT	<i>Centunculus minimus</i> (<i>Anagallis minima</i>)	EN	A2c AOO and EOO trend	59	77					
VU	<i>Cephalanthera damasonium</i>	VU	A2c AOO trend	33						
VU	<i>Cephalanthera longifolia</i>	EN	A2c AOO trend	48						
CR	<i>Cephalanthera rubra</i>	CR	C2a(i); D				33			
LC	<i>Cerastium alpinum</i>	VU	D1			3	<1000			
LC	<i>Cerastium arvense</i>	NT	A2c AOO trend	20						
LC	<i>Cerastium diffusum</i>	LC								
LC	<i>Cerastium fontanum</i>	LC								
LC	<i>Cerastium fontanum</i> subsp. <i>holosteoides</i>	LC								
LC	<i>Cerastium fontanum</i> subsp. <i>vulgare</i>	LC								
LC	<i>Cerastium glomeratum</i>	LC								
LC	<i>Cerastium pumilum</i>	LC								
LC	<i>Cerastium semidecandrum</i>	LC								

International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
	77		
	82		
	76	Arch	A confidence level of 90% was accepted for the AOO trend.
	6		A confidence level of 85% was accepted for the AOO trend.
		Arch	
	87		
			Insufficient mapping data.
			Assumed LC as species.
	100	Arch	
	81	Arch	LC for the period 1930-1999 but a 30% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			Non-radiate plants are probably referable to subsp. <i>nemoralis</i> (Stace 2010). Mapping information insufficient.
			Plants with pseudo-radiate capitula are common and occur with non-radiate plants (ssp. <i>nemoralis</i>); these are probably not worth recognition as a separate subspecies (Stace 2010).
	91		
	76		
			LC for the period 1930-1999 but a 44% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	91		
	100		See Section 6.9.1. for an explanation on the change of status for this 'England-only' species.
	100		
	100		
	2		
	81		
			Assumed LC as species.
			Assumed LC as species.
	89		LC for the period 1930-1999 but a 49% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Ceratocarpus claviculata</i>	LC								
LC	<i>Ceratophyllum demersum</i>	LC								
LC	<i>Ceratophyllum submersum</i>	LC								
LC	<i>Chaenorhinum minus</i>	LC								
LC	<i>Chaerophyllum temulum</i>	LC								
VU	<i>Chamaemelum nobile</i>	VU	A2c AOO and EOO trend	49	36					
LC	<i>Chamerion angustifolium</i>	LC								
LC	<i>Chelidonium majus</i>	LC								
LC	<i>Chenopodium album</i> agg.	LC								
VU	<i>Chenopodium bonus-henricus</i>	VU	A2c AOO trend	49						
LC	<i>Chenopodium chenopodioides</i>	LC								
LC	<i>Chenopodium ficifolium</i>	LC								
VU	<i>Chenopodium glaucum</i>	VU	A2c AOO trend	47						
LC	<i>Chenopodium hybridum</i>	LC								
VU	<i>Chenopodium murale</i>	EN	A2c EOO trend		57					
LC	<i>Chenopodium polyspermum</i>	LC								
LC	<i>Chenopodium rubrum</i>	LC								
CR	<i>Chenopodium urbicum</i>	CR	A2c AOO trend	85						
EN	<i>Chenopodium vulvaria</i>	EN	A2c AOO trend	76						
LC	<i>Chrysosplenium alternifolium</i>	LC								
LC	<i>Chrysosplenium oppositifolium</i>	LC								
VU	<i>Cicendia filiformis</i>	VU	A2c AOO and EOO trend	43	48					
LC	<i>Cichorium intybus</i>	VU	A2c AOO trend	35						
LC	<i>Cicuta virosa</i>	LC								
LC	<i>Circaea alpina</i>	LC								
LC	<i>Circaea lutetiana</i>	LC								
LC	<i>Cirsium acaule</i>	LC								
LC	<i>Cirsium arvense</i>	LC								
LC	<i>Cirsium dissectum</i>	LC								
LC	<i>Cirsium eriophorum</i>	LC						N2		
LC	<i>Cirsium heterophyllum</i>	NT	A2c AOO trend	20						
LC	<i>Cirsium palustre</i>	LC								
NT	<i>Cirsium tuberosum</i>	NT	B		<30					
LC	<i>Cirsium vulgare</i>	LC								
LC	<i>Cladium mariscus</i>	LC								
LC	<i>Clematis vitalba</i>	LC								

International responsibility?
 Proportion (%) of GB hectads in England
 Native_archaeophyte

Comments

	93		
	94		LC for the period 1930-1999 but a 33% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	81	Arch	
	80		
	94		
	82	Arch	
	82	Arch	
	100		LC for the period 1930-1999 but a 55% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	95	Arch	
	95	Arch	
	97	Arch	LC for the period 1930-1999 but a 43% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	95	Arch	
	92	Arch	
	92		
	82	Arch	
	91	Arch	
	76		
	86	Arch	
			LC for the period 1930-1999 but a 55% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	97		
possibly			LC for the period 1930-1999 but a 35% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	95		
			The AOO decline is based on the results of higher resolution surveys by Pacha <i>et al.</i> 2008
	80		
			LC for the period 1930-1999 but a 43% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	90		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
VU	<i>Clinopodium acinos</i>	VU	A2c AOO and EOO trend	45	41					
LC	<i>Clinopodium ascendens</i>	LC					N2			
VU	<i>Clinopodium calamintha</i>	LC					N2			
CR	<i>Clinopodium menthifolium</i>	VU	D2			1	c.1500			
LC	<i>Clinopodium vulgare</i>	LC								
LC	<i>Cochlearia anglica</i>	LC								
LC	<i>Cochlearia danica</i>	LC								
LC	<i>Cochlearia officinalis</i>	LC								
LC	<i>Cochlearia officinalis</i> s.l.	LC								
LC	<i>Cochlearia pyrenaica</i>	LC								
DD	<i>Cochlearia pyrenaica</i> subsp. <i>alpina</i>	DD								
DD	<i>Cochlearia pyrenaica</i> subsp. <i>pyrenaica</i>	DD								
VU	<i>Coeloglossum viride</i> (<i>Dactylorhiza viridis</i>)	VU	A2c AOO and EOO trend	46	46					
LC	<i>Coincya monensis</i>	LC								
VU	<i>Coincya wrightii</i>	NT	D				<10000	yes		
NT	<i>Colchicum autumnale</i>	LC					N2			
LC	<i>Comarum palustre</i> (<i>Potentilla palustris</i>)	NT	A2c AOO trend	20						
LC	<i>Conium maculatum</i>	LC								
LC	<i>Conopodium majus</i>	LC								
LC	<i>Convallaria majalis</i>	LC								
LC	<i>Convolvulus arvensis</i>	LC								
VU	<i>Corallorhiza trifida</i>	VU	B1ab(i-v) + 2ab(i-v)				<10			
LC	<i>Cornus sanguinea</i>	LC								
NT	<i>Cornus suecica</i>	NT	B		<30					
CR	<i>Corrigiola litoralis</i>	EN	D				c.400			
LC	<i>Corylus avellana</i>	LC								
NT	<i>Corynephorus canescens</i>	NT	B		<30					
LC	<i>Crambe maritima</i>	LC								
VU	<i>Crassula aquatica</i>	RE								
LC	<i>Crassula tillaea</i>	LC					N2			
LC	<i>Crataegus laevigata</i>	LC								
LC	<i>Crataegus monogyna</i>	LC								
LC	<i>Crepis biennis</i>	LC								
LC	<i>Crepis capillaris</i>	LC								
EW	<i>Crepis foetida</i>	CR	A2c AOO trend; D			1				

International responsibility?	Proportion (%) of GB hectads in England	Native__archaeophyte	Comments
	97		
	93		
	100		LC for the period 1930-1999 but a 44% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		The population is continuing to recover after decades of positive conservation work (Marston 2007), hence the change in GB status for this England-only species.
	83		
			The sole native subspecies in England is <i>Cochlearia officinalis</i> subsp. <i>officinalis</i> .
			The sole native subspecies in England is <i>Coincya monensis</i> subsp. <i>monensis</i> .
yes	100		The total population on Lundy fluctuates between 1000 and 10000 individuals.
	91		LC for the period 1930-1999 but a 43% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	79	Arch	
possibly			
	90		
	81		
	92		The sole native subspecies in England is <i>Cornus sanguinea</i> subsp. <i>sanguinea</i> .
	4		
	100		The number of individuals exceeds the EN (D) threshold, but this count includes bolstered individuals from recent introductions. A precautionary approach has been taken, and so the species is assessed based on a fluctuating population of <250 native individuals.
	100		
			Not seen at its sole English location since 1949.
	100		
	100		
	100	Arch	See Section 6.9.1.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
EN	<i>Crepis mollis</i>	VU	A2c AOO trend	51						
LC	<i>Crepis paludosa</i>	LC								
EN	<i>Crepis praemorsa</i>	VU	D2			1	1775			
LC	<i>Crithmum maritimum</i>	LC								
LC	<i>Cruciata laevipes</i>	NT		22						
LC	<i>Cryptogramma crispa</i>	VU	A2c AOO trend	34						
VU	<i>Cuscuta epithymum</i>	VU	A2c AOO and EOO trend	38	35					
LC	<i>Cuscuta europaea</i>	LC								
WL	<i>Cynodon dactylon</i>	WL								
CR	<i>Cynoglossum germanicum</i>	NT	B		<30	>10000	N2			
NT	<i>Cynoglossum officinale</i>	NT	A2c AOO trend	28						
LC	<i>Cynosurus cristatus</i>	LC								
VU	<i>Cyperus fuscus</i>	VU	A2c AOO trend	30						
NT	<i>Cyperus longus</i>	NT	A2c AOO trend	20						
CR	<i>Cypridium calceolus</i>	CR	D			1	2			
EX	<i>Cystopteris alpina</i>	EX								
VU	<i>Cystopteris diaphana</i>	VU	D2			5	>1000	N2		
LC	<i>Cystopteris fragilis</i>	LC								
LC	<i>Cytisus scoparius</i>	LC								
LC	<i>Cytisus scoparius</i> subsp. <i>maritimus</i>	VU	D2			≤5				
LC	<i>Cytisus scoparius</i> subsp. <i>scoparius</i>	LC								
LC	<i>Dactylis glomerata</i>	LC								
LC	<i>Dactylorhiza fuchsii</i>	LC								
LC	<i>Dactylorhiza incarnata</i>	LC								
LC	<i>Dactylorhiza incarnata</i> subsp. <i>coccinea</i>	NT	B; D			<30				
DD	<i>Dactylorhiza incarnata</i> subsp. <i>gemmana</i>	DD								
WL	<i>Dactylorhiza incarnata</i> subsp. <i>incarnata</i>	WL								
CR	<i>Dactylorhiza incarnata</i> subsp. <i>ochroleuca</i>	CR	C2a(i)			2	c.63			
WL	<i>Dactylorhiza incarnata</i> subsp. <i>pulchella</i>	WL								
LC	<i>Dactylorhiza maculata</i>	LC								
LC	<i>Dactylorhiza praetermissa</i>	LC								
LC	<i>Dactylorhiza purpurella</i>	LC					S2			

International responsibility?	Proportion (%) of GB hectads in England	Native/archaeophyte	Comments
	82		Recently published evidence suggest that <i>Crepis mollis</i> has been mis-identified in the past, hence the downgrading of threat status from EN to VU based on AOO (see Section 7).
	100		The population estimate is based on Roberts (2009). See Section 7.
	78		
	97		
	100		LC for the period 1930-1999 but a 60% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			Its status in the UK is uncertain, with some populations being considered possibly native in W Cornwall. It is frequently found as a casual species.
	100		A dynamic, process-driven species that benefited from the 'Great Storm' of 1987.
	88		
	100		
	80		
	100		The threat status does not include numerous introductions as there is not yet evidence of introduced plants producing viable offspring.
	100		Extant sub-populations are vulnerable to fluctuating water levels and bank erosion.
			In England, this taxon is only present in North Devon, where it is locally abundant, and the Lizard peninsula where it appears to be in decline due to undergrazing and scrub encroachment. A precautionary threat status of VU D2 has been applied pending further investigation/survey. Assumed LC as species.
			The sole component/native subspecies in England is <i>Dactylorhiza fuchsii</i> subsp. <i>fuchsii</i> . LC for the period 1930-1999 but a 43% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			The taxon is vulnerable to habitat loss through lack of grazing and scrub encroachment on dune systems. A targeted survey in England of <i>D. incarnata</i> subsp. <i>coccinea</i> would help to determine whether this taxon requires a higher threat status.
	100		Seemingly lost from one of the three known locations (Chippenham Fen NNR).
			More research is required into the <i>D. incarnata</i> group.
			The sole component/native subspecies in England is <i>Dactylorhiza maculata</i> subsp. <i>ericetorum</i> .
possibly	88		The distribution of this species includes the newly described <i>D. praetermissa</i> subsp. <i>schoenophila</i> established by Bateman & Denholm (2012).

possibly

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Dactylorhiza traunsteinerioides</i> (<i>Dactylorhiza traunsteineri</i>)	LC								
CR	<i>Damasonium alisma</i>	CR	D			1	0	N2		
LC	<i>Danthonia decumbens</i>	LC								
LC	<i>Daphne laureola</i>	LC						N2		
VU	<i>Daphne mezereum</i>	VU	A2c AOO trend	49						
LC	<i>Daucus carota</i>	LC								
LC	<i>Daucus carota</i> subsp. <i>carota</i>	LC								
LC	<i>Daucus carota</i> subsp. <i>gummifer</i>	LC								
LC	<i>Deschampsia cespitosa</i>	LC								
LC	<i>Deschampsia cespitosa</i> subsp. <i>cespitosa</i>	LC								
LC	<i>Deschampsia cespitosa</i> subsp. <i>parviflora</i>	LC								
LC	<i>Deschampsia flexuosa</i>	LC								
LC	<i>Deschampsia setacea</i>	VU	A2c AOO trend	45						
LC	<i>Descurainia sophia</i>	LC								
EN	<i>Dianthus armeria</i>	EN	A2c AOO trend	71						
NT	<i>Dianthus deltoides</i>	VU	A2c AOO and EOO trend	39	43					
VU	<i>Dianthus gratianopolitanus</i>	VU	D1			8?	<1000			
LC	<i>Digitalis purpurea</i>	LC								
LC	<i>Diphasiastrum alpinum</i>	LC								
NT	<i>Diphasiastrum complanatum</i>	CR	D			1	1?			
LC	<i>Diploxys tenuifolia</i>	LC								
LC	<i>Dipsacus fullonum</i>	LC								
LC	<i>Dipsacus pilosus</i>	LC								
LC	<i>Draba incana</i>	LC								
LC	<i>Draba muralis</i>	LC								
NT	<i>Drosera anglica</i>	EN	A2c EOO trend		62					
LC	<i>Drosera intermedia</i>	VU	A2c AOO trend	39						
LC	<i>Drosera rotundifolia</i>	NT	A2c AOO and EOO trend	29	28					
LC	<i>Dryas octopetala</i>	VU	D2			4				
LC	<i>Dryopteris aemula</i>	LC								
LC	<i>Dryopteris affinis</i>	LC								
LC	<i>Dryopteris affinis</i> s.l.	LC								
LC	<i>Dryopteris affinis</i> subsp. <i>affinis</i>	LC								

International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
			There are taxonomic uncertainties surrounding this taxon (see Bateman & Denholm (2012), with most southern populations now considered to be <i>D. praetermissa</i> subsp. <i>schoenophila</i> rather than <i>D. traunsteinerioides</i> . Southern populations make up a small proportion of the total distribution for this taxon, and so the threat assessment of LC has been retained.
	100		The last native plant in GB was recorded in 2004. As the species is thought to have a long-lived seed bank, it has been assessed as CR but urgent action is required.
	94		
	92		This status excludes all presumed neophyte records.
	75		
			Assumed LC as species.
			Assumed LC as species.
			Assumed LC as species.
			Assumed LC as species.
	81	Arch	
	89		
	100		The number of native extant locations is difficult to estimate for this species, and may be as few as five, in which case the species would also qualify as VU D2.
	9		LC for the period 1930-1999 but a 40% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7. Only one individual recorded from its sole England location.
	88	Arch	
			Native or alien.
	96		
	97		LC for the period 1930-1999 but a 50% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	7		
	4		
			Assumed LC as species.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Dryopteris affinis</i> subsp. <i>paleaceolobata</i>	LC								
LC	<i>Dryopteris cambrensis</i>	LC								
LC	<i>Dryopteris carthusiana</i>	LC								
CR	<i>Dryopteris cristata</i>	EN	A2c AOO trend	66						
LC	<i>Dryopteris dilatata</i>	LC								
LC	<i>Dryopteris expansa</i>	LC								
LC	<i>Dryopteris filix-mas</i>	LC								
LC	<i>Dryopteris oreades</i>	LC								
LC	<i>Dryopteris submontana</i>	LC					N3			
LC	<i>Echium vulgare</i>	LC								
LC	<i>Elatine hexandra</i>	LC								
LC	<i>Elatine hydropiper</i>	VU	D2		2	low 100s				
LC	<i>Eleocharis acicularis</i>	NT	A2c AOO trend	24						
LC	<i>Eleocharis mamillata</i> (<i>Eleocharis austriaca</i>)	LC								
LC	<i>Eleocharis multicaulis</i>	LC								
LC	<i>Eleocharis palustris</i>	LC								
DD	<i>Eleocharis palustris</i> subsp. <i>palustris</i>	DD								
LC	<i>Eleocharis palustris</i> subsp. <i>vulgaris</i>	LC								
LC	<i>Eleocharis parvula</i>	EN	B1ab(v) + 2ab(v)		3					
LC	<i>Eleocharis quinqueflora</i>	LC								
LC	<i>Eleocharis uniglumis</i>	LC								
LC	<i>Eleogiton fluitans</i>	LC								
LC	<i>Elymus caninus</i>	LC								
LC	<i>Elytrigia atherica</i>	LC								
LC	<i>Elytrigia campestris</i> (<i>Elytrigia repens</i> subsp. <i>arenosa</i>)	DD								
LC	<i>Elytrigia juncea</i>	LC								
LC	<i>Elytrigia repens</i>	LC								
LC	<i>Empetrum nigrum</i>	LC								
LC	<i>Empetrum nigrum</i> subsp. <i>hermaphroditum</i>	VU	D2		≤5					
LC	<i>Empetrum nigrum</i> subsp. <i>nigrum</i>	LC								
LC	<i>Epilobium alsinifolium</i>	LC								
LC	<i>Epilobium anagallidifolium</i>	VU	D1; D2		5	low 100s				
LC	<i>Epilobium hirsutum</i>	LC								
LC	<i>Epilobium lanceolatum</i>	LC								
LC	<i>Epilobium montanum</i>	LC								
LC	<i>Epilobium obscurum</i>	LC								

International responsibility?
 Proportion (%) of GB hecctads in England
 Native_archaeophyte

Comments

Assumed LC as species.

The sole native subspecies in England is *Dryopteris cambrensis* subsp. *cambrensis*.

100

8

96

83

8

This species is assessed as NT based on AOO decline, although the aquatic form is easily missed.

85

LC for the period 1930-1999 but a 44% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.

Assumed LC as species.

LC for the period 1930-1999 but a 41% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.

LC for the period 1930-1999 but a 36% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.

LC for the period 1930-1999 but a 41% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.

83

The sole native subspecies in England is *Elytrigia campestris* subsp. *maritima*.

The sole native subspecies in England is *Elytrigia juncea* subsp. *boreoatlantica*.

Assumed LC as species.

4

86

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Epilobium palustre</i>	LC								
LC	<i>Epilobium parviflorum</i>	LC								
LC	<i>Epilobium roseum</i>	LC								
LC	<i>Epilobium tetragonum</i>	LC								
LC	<i>Epipactis atrorubens</i>	LC								
DD	<i>Epipactis dunensis</i>	DD								
LC	<i>Epipactis helleborine</i>	LC								
DD	<i>Epipactis leptochila</i> (<i>Epipactis leptochila</i> subsp. <i>leptochila</i>)	DD								
LC	<i>Epipactis leptochila</i> agg.	LC								
LC	<i>Epipactis palustris</i>	NT	A2c AOO trend	23						
LC	<i>Epipactis phyllanthes</i>	LC								
LC	<i>Epipactis purpurata</i>	LC								
EN	<i>Epipactis sancta</i>	EN	D			1	c.70	yes		
CR	<i>Epipogium aphyllum</i>	CR	D			1	1			
LC	<i>Equisetum arvense</i>	LC								
LC	<i>Equisetum fluviatile</i>	LC								
LC	<i>Equisetum hyemale</i>	LC								
LC	<i>Equisetum palustre</i>	LC								
LC	<i>Equisetum pratense</i>	NT	B			<30				
VU	<i>Equisetum ramosissimum</i>	VU	D2			<5				
LC	<i>Equisetum sylvaticum</i>	LC								
LC	<i>Equisetum telmateia</i>	LC								
LC	<i>Equisetum variegatum</i>	LC								
LC	<i>Erica ciliaris</i>	LC					N2			
LC	<i>Erica cinerea</i>	NT	A2c AOO trend	29						
LC	<i>Erica tetralix</i>	NT	A2c AOO trend	29						
LC	<i>Erica vagans</i>	NT	B			<30				
LC	<i>Erigeron acris</i> (<i>Erigeron acer</i>)	LC								
LC	<i>Eriophorum angustifolium</i>	VU	A2c AOO trend	33						
NT	<i>Eriophorum gracile</i>	VU	D2			3				
LC	<i>Eriophorum latifolium</i>	LC								
LC	<i>Eriophorum vaginatum</i>	LC								
LC	<i>Erodium cicutarium</i>	LC								
LC	<i>Erodium lebelii</i>	LC								
LC	<i>Erodium maritimum</i>	LC								
LC	<i>Erodium moschatum</i>	LC								

International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
	77		
	89		The sole native subspecies in England is <i>Epilobium tetragonum</i> subsp. <i>tetragonum</i> .
	77		
			<i>Epipactis leptochila</i> agg. includes <i>E. leptochila</i> s.s. and <i>E. dunensis</i> .
yes	100		
yes	100		Population estimate from 2013 (C. Metherell pers. comm.).
	100		Rediscovered in 2009 after an absence of 23 years. Only one plant was recorded, but any population count for this species is fraught with difficulty.
			LC for the period 1930-1999 but a 52% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	7		
	100		Native or alien.
	81		
			LC for the period 1930-1999 but a 38% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
possibly	100		LC for the period 1930-1999 but a 44% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			Still a common species in suitable habitat, the threat status reflects the historical decline of chalk heath in S England.
			Widespread historical declines in southern England, but still a common species where suitable habitat persists. See Section 6.8.
	100		The threat status highlights past declines and the vulnerability of remaining locations.
	93		
			Drainage and loss of traditional grazing management have substantially reduced the abundance of this species in lowland England since 1930.
			LC for the period 1930-1999 but a 53% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	87	Arch	LC for the period 1930-1999 but a 36% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Erophila glabrescens</i>	LC								
LC	<i>Erophila majuscula</i>	LC								
LC	<i>Erophila verna</i>	LC								
LC	<i>Erophila verna</i> s.l.	LC								
CR	<i>Eryngium campestre</i>	NT	B		<30					
LC	<i>Eryngium maritimum</i>	NT	A2c AOO and EOO trend	30	28					
LC	<i>Erysimum cheiranthoides</i>	NT	A2c AOO trend	22						
LC	<i>Erysimum cheiri</i>	LC								
LC	<i>Euonymus europaeus</i>	LC								
LC	<i>Eupatorium cannabinum</i>	LC								
LC	<i>Euphorbia amygdaloides</i>	LC					N2			
NT	<i>Euphorbia exigua</i>	VU	A2c AOO trend	37						
LC	<i>Euphorbia helioscopia</i>	LC								
VU	<i>Euphorbia hyberna</i>	VU	D1; D2			3	<500			
LC	<i>Euphorbia lathyris</i>	LC								
LC	<i>Euphorbia paralias</i>	LC								
EX	<i>Euphorbia peplis</i>	EX					N2			
LC	<i>Euphorbia peplus</i>	LC								
LC	<i>Euphorbia platyphyllos</i>	LC								
LC	<i>Euphorbia portlandica</i>	LC								
LC	<i>Euphorbia stricta</i> (<i>E. serrulata</i>)	DD								
DD	<i>Euphrasia arctica</i>	VU	A2c AOO and EOO trend	62	73					
DD	<i>Euphrasia arctica</i> subsp. <i>arctica</i>	DD								
DD	<i>Euphrasia arctica</i> subsp. <i>borealis</i>	DD								
DD	<i>Euphrasia confusa</i>	VU	A2c AOO trend	37						
DD	<i>Euphrasia frigida</i>	LC					S2			
DD	<i>Euphrasia micrantha</i>	EN	A2c AOO and EOO trend	61	63					
LC	<i>Euphrasia nemorosa</i>	NT	A2c AOO and EOO trend	30						
LC	<i>Euphrasia officinalis</i> agg.	LC								
EN	<i>Euphrasia officinalis</i> subsp. <i>anglica</i> (<i>Euphrasia anglica</i>)	EN	A2c AOO trend							
VU	<i>Euphrasia officinalis</i> subsp. <i>monticola</i> (<i>Euphrasia rostkoviana</i> subsp. <i>montana</i>)	DD								

International responsibility?
 Proportion (%) of GB hecctads in England
 Native_archaeophyte

Comments

			LC for the period 1930-1999 but a 49% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
100	Arch		The threat status for <i>E. campestre</i> is based on a low number of locations and continuing decline since 1930. AOO trends were not significant and EOO trends not reliable due to the small number of locations (see Section 4.7).
88	Arch		
82	Arch		
88			
76			
92			The sole native subspecies in England is <i>Euphorbia amygdaloides</i> subsp. <i>amygdaloides</i> .
95	Arch		
	Arch		
100			
90	Arch		
77	Arch		
99	Arch		LC for the period 1930-1999 but a 32% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			Native or alien. A recent survey of the English populations is required to determine the threat status for this species. DD status recognises the assertion in Wiggington (1999) and Preston <i>et al.</i> (2002) that 'while distribution is more or less stable, populations have declined markedly in recent years'.
			There are taxonomic issues surrounding this subspecies that are not yet resolved.
	possibly		
			<i>Euphrasia officinalis</i> agg. continues to be used as a 'catch all' name for all <i>Euphrasia</i> taxa not identified to species level. This taxon is also found in Ireland and S.W. Scotland, but its distribution is mainly within England. The GB status has, therefore, been retained
75			The GB status for this potentially England-only taxon is retained.
			The range of this taxon has recently been extended to Teesdale and S. Northumbria localities within hay meadow habitat, and as such current trend data are difficult to interpret. In addition, there are taxonomic uncertainties surrounding this subspecies that require clarification.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
VU	<i>Euphrasia officinalis</i> subsp. <i>pratensis</i> (<i>Euphrasia rostkoviana</i> subsp. <i>rostkoviana</i>)	VU	A2c AOO trend							
DD	<i>Euphrasia ostenfeldii</i>	DD								
EN	<i>Euphrasia pseudokernerii</i>	VU	A2c AOO and EOO trend	46	48					
VU	<i>Euphrasia rivularis</i>	VU	D1			<1000			yes	
LC	<i>Euphrasia scottica</i>	LC					S2			
LC	<i>Euphrasia tetraquetra</i>	NT	A2c AOO trend	27						
EN	<i>Euphrasia vigursii</i>	EN	A2c AOO trend	68				yes		
LC	<i>Fagus sylvatica</i>	LC								
LC	<i>Fallopia convolvulus</i>	LC								
VU	<i>Fallopia dumetorum</i>	VU	A2c AOO and EOO trend	34	35					
LC	<i>Festuca altissima</i>	LC								
LC	<i>Festuca arenaria</i>	LC								
LC	<i>Festuca filiformis</i>	LC								
LC	<i>Festuca lemanii</i>	DD								
LC	<i>Festuca longifolia</i>	LC					N2			
LC	<i>Festuca ovina</i>	LC								
LC	<i>Festuca ovina</i> agg.	LC								
LC	<i>Festuca rubra</i> agg.	LC								
LC	<i>Festuca rubra</i> subsp. <i>arctica</i>	LC								
LC	<i>Festuca rubra</i> subsp. <i>commutata</i>	LC								
LC	<i>Festuca rubra</i> subsp. <i>juncea</i>	LC								
LC	<i>Festuca rubra</i> subsp. <i>litoralis</i>	LC								
LC	<i>Festuca rubra</i> subsp. <i>rubra</i>	LC								
DD	<i>Festuca rubra</i> subsp. <i>scotica</i>	DD								
LC	<i>Festuca vivipara</i>	LC								
LC	<i>Ficaria verna</i> (<i>Ranunculus ficaria</i>)	LC								
LC	<i>Ficaria verna</i> subsp. <i>fertilis</i> (<i>Ranunculus ficaria</i> subsp. <i>ficaria</i>)	LC								
LC	<i>Ficaria verna</i> subsp. <i>verna</i> (<i>Ranunculus ficaria</i> subsp. <i>bulbilifer</i>)	LC								
EW	<i>Filago gallica</i>	EW								
EN	<i>Filago lutescens</i>	EN	A2c AOO trend	48						
LC	<i>Filago minima</i>	NT	A2c AOO trend	24						
EN	<i>Filago pyramidata</i>	EN	A2c AOO trend	68						
NT	<i>Filago vulgaris</i>	NT	A2c AOO trend	26						
LC	<i>Filipendula ulmaria</i>	LC								
LC	<i>Filipendula vulgaris</i>	LC								
LC	<i>Foeniculum vulgare</i>	LC								

International responsibility?	Proportion (%) of GB hecctads in England	Native__archaeophyte	Comments
			The GB status for the taxon is retained.
	96		
yes	75		In England this species is restricted to the Lake District.
possibly			
yes	100		
		Arch	
	100		
			Native or alien.
possibly	100		
			Assumed LC as species.
	6		
			Assumed LC as species.
			Assumed LC as species.
	100	Arch	
	100		
	100	Arch	
	90		
	96		
	86	Arch	

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Fragaria vesca</i>	NT	A2c AOO trend	29						
LC	<i>Frangula alnus</i>	LC								
NT	<i>Frankenia laevis</i>	NT	A2c AOO trend	29			N2			
LC	<i>Fraxinus excelsior</i>	LC								
WL	<i>Fritillaria meleagris</i>	WL								
LC	<i>Fumaria bastardii</i>	LC								
LC	<i>Fumaria capreolata</i>	LC								
LC	<i>Fumaria densiflora</i>	LC								
LC	<i>Fumaria muralis</i>	LC								
LC	<i>Fumaria muralis</i> subsp. <i>boraei</i>	LC								
WL	<i>Fumaria muralis</i> subsp. <i>muralis</i>	WL								
LC	<i>Fumaria muralis</i> subsp. <i>neglecta</i>	DD						yes		
LC	<i>Fumaria occidentalis</i>	LC						yes		
LC	<i>Fumaria officinalis</i>	LC								
LC	<i>Fumaria officinalis</i> subsp. <i>officinalis</i>	LC								
LC	<i>Fumaria officinalis</i> subsp. <i>wirtgenii</i>	LC								
VU	<i>Fumaria parviflora</i>	NT	A2c EOO trend		27					
LC	<i>Fumaria purpurea</i>	VU	A2c AOO trend	37						
LC	<i>Fumaria reuteri</i>	LC								
VU	<i>Fumaria vaillantii</i>	EN	A2c EOO trend		62					
LC	<i>Gagea lutea</i>	LC								
CR	<i>Galeopsis angustifolia</i>	CR	A2c AOO and EOO trend	80	86					
LC	<i>Galeopsis bifida</i>	LC								
EX	<i>Galeopsis segetum</i>	EX								
VU	<i>Galeopsis speciosa</i>	VU	A2c AOO trend	48						
LC	<i>Galeopsis tetrahit</i> agg.	LC								
LC	<i>Galium album</i> (<i>Galium mollugo</i>)	LC								
LC	<i>Galium aparine</i>	LC								
LC	<i>Galium boreale</i>	LC								
LC	<i>Galium constrictum</i>	LC					N2			
LC	<i>Galium odoratum</i>	LC								
LC	<i>Galium palustre</i>	LC								
VU	<i>Galium parisiense</i>	VU	A2c AOO trend	45			N2			
EN	<i>Galium pumilum</i> s.l.	EN	A2c AOO trend	52						
LC	<i>Galium saxatile</i>	LC								

	International responsibility?	Proportion (%) of GB hectads in England	Native archaeophyte	Comments
		92		
possibly		100?		A confidence level of 85% was accepted for the AOO trend. Two locations in Wales are considered 'native or introduced' (T.D. Dines pers. comm.).
				Probably a neophyte (Pearman 2007) but is on WL pending the outcome of genetic studies.
		75	Arch	The sole native subspecies in England is <i>Fumaria capreolata</i> subsp. <i>babingtonii</i> . LC for the period 1930-1999 but a 40% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
				Assumed LC as species.
				Insufficient mapping data. An enigmatic taxon not recorded for many years.
yes				Sell (1998) states that plants not seen for years and may well be extinct, but there are recent unconfirmed reports of this taxon from Scilly, and it may be overlooked within its native range. Distribution data is almost certainly incomplete, hence an assessment of DD.
yes		100		
			Arch	
			Arch	Assumed LC as species.
			Arch	Assumed LC as species.
		97	Arch	
yes		100	Arch	Neophyte or archaeophyte. LC for the period 1930-1999 but a 45% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
		97	Arch	
		84		LC for the period 1930-1999 but a 39% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
		98	Arch	
		75	Arch	
			Arch	
		84		
				LC for the period 1930-1999 but a 39% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
		100		
		100		
		100		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Galium sternerii</i>	LC								
CR	<i>Galium tricornerutum</i>	CR	A2c; B1ab(i-v) +2ab(i-v)	92		1	c.400			
LC	<i>Galium uliginosum</i>	LC								
LC	<i>Galium verum</i>	LC								
LC	<i>Gastroidium ventricosum</i>	LC								
LC	<i>Gaudinia fragilis</i>	LC								
NT	<i>Genista anglica</i>	VU	A2c AOO trend	46						
NT	<i>Genista pilosa</i>	NT	B		<30					
LC	<i>Genista tinctoria</i>	VU	A2c EOO trend		38					
LC	<i>Genista tinctoria</i> subsp. <i>littoralis</i>	LC								
LC	<i>Genista tinctoria</i> subsp. <i>tinctoria</i>	VU	A2c EOO trend							
LC	<i>Gentiana pneumonanthe</i>	NT	A2c EOO trend							
LC	<i>Gentiana verna</i>	VU	A2ac; B1ab(v)+2ab(v)	>30						
LC	<i>Gentianella amarella</i>	NT	A2c AOO and EOO trend	24	21					
LC	<i>Gentianella amarella</i> subsp. <i>amarella</i>	NT	A2c AOO and EOO trend							
NT	<i>Gentianella amarella</i> subsp. <i>septentrionalis</i>	VU	D1			<1000			yes	
WL	<i>Gentianella anglica</i>	WL								
VU	<i>Gentianella campestris</i>	EN	A2c AOO and EOO trend	54	52					
VU	<i>Gentianella germanica</i>	VU	A2C EOO trend		37					
WL	<i>Gentianella uliginosa</i>	WL								
CR	<i>Gentianopsis ciliata</i> (<i>Gentianella ciliata</i>)	CR	D			1	3			
LC	<i>Geranium columbinum</i>	LC								
LC	<i>Geranium dissectum</i>	LC								
LC	<i>Geranium lucidum</i>	LC								
LC	<i>Geranium molle</i>	LC								
LC	<i>Geranium pratense</i>	LC								
LC	<i>Geranium purpureum</i>	LC								
LC	<i>Geranium pusillum</i>	LC								
LC	<i>Geranium robertianum</i>	LC								
LC	<i>Geranium rotundifolium</i>	LC						N2		
LC	<i>Geranium sanguineum</i>	NT	A2c EOO trend							
LC	<i>Geranium sylvaticum</i>	NT	A2a AOO trend	>20						
LC	<i>Geum rivale</i>	LC								
LC	<i>Geum urbanum</i>	LC								

possibly	International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
	100	Arch		Threat status based on historical decline, but the AOO figure is known to be an underestimate as losses have continued since 1999. The most recent count from its sole GB location is given here.
				The sole native subspecies in England is <i>Galium verum</i> subsp. <i>verum</i> .
	91			Native or alien. LC for the period 1930-1999 but a 78% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7
	98			Native or alien.
	86			
	100			This subspecies occurs only along the Cornish coastline. It is thought to be stable based on recent surveys, hence a threat assessment of LC.
	94			
	100			The change in status for this England-only GB taxon is explained in more detail in Section 7.
	97			The threat status for this taxon is based on a current estimate of the population in England using records and associated comments on abundance from RPRs and the DDb. Genetically similar to <i>G. amarella</i> , but flowers early and is morphologically distinct. Sell & Murrell name this taxon <i>Gentianella amarella</i> subsp. <i>amarella</i> var. <i>praecox</i> .
	100			
				Genetically similar to <i>G. amarella</i> . Sell & Murrell (2009) name this taxon <i>Gentianella amarella</i> subsp. <i>amarella</i> var. <i>uliginosa</i> .
	100			
	78			
		Arch		
	75			
	100			
	88			
	97			
				NT status based on Pacha & Petit (2008).

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Gladiolus illyricus</i>	VU	A2a AOO trend	>30			N2		Yes	
LC	<i>Glaucium flavum</i>	NT	A2c AOO trend	20						
LC	<i>Glaux maritima</i>	LC								
VU	<i>Glebionis segetum</i> (<i>Chrysanthemum segetum</i>)	VU	A2c AOO trend	>30						
LC	<i>Glechoma hederacea</i>	LC								
LC	<i>Glyceria declinata</i>	LC								
LC	<i>Glyceria fluitans</i>	LC								
LC	<i>Glyceria maxima</i>	LC								
LC	<i>Glyceria notata</i>	LC								
EN	<i>Gnaphalium sylvaticum</i>	EN	A2c AOO and EOO trend	63	73					
LC	<i>Gnaphalium uliginosum</i>	LC								
LC	<i>Goodyera repens</i>	LC								
VU	<i>Groenlandia densa</i>	VU	A2c AOO and EOO trend	34						
LC	<i>Gymnadenia borealis</i>	DD								
LC	<i>Gymnadenia conopsea</i>	LC								
LC	<i>Gymnadenia conopsea</i> agg.	LC								
DD	<i>Gymnadenia densiflora</i>	DD								
LC	<i>Gymnocarpium dryopteris</i>	NT	A2c AOO and EOO trend	25	23					
LC	<i>Gymnocarpium robertianum</i>	LC								
LC	<i>Hammarbya paludosa</i>	VU	A2c AOO and EOO trend	30	39					
LC	<i>Hedera helix</i> (<i>Hedera helix</i> subsp. <i>helix</i>)	LC								
LC	<i>Hedera helix</i> s.l.	LC								
LC	<i>Hedera hibernica</i> (<i>Hedera helix</i> subsp. <i>hibernica</i>)	LC								
VU	<i>Helianthemum apenninum</i>	VU	D2			4		N2		
LC	<i>Helianthemum nummularium</i>	NT	A2c AOO trend	22						
LC	<i>Helianthemum oelandicum</i>	LC								
LC	<i>Helianthemum oelandicum</i> subsp. <i>incanum</i>	LC								
VU	<i>Helianthemum oelandicum</i> subsp. <i>levigatum</i>	VU	D2			1	300-1200		yes	
LC	<i>Helleborus foetidus</i>	LC								

International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
100			The sole native subspecies in England is <i>Gladiolus illyricus</i> subsp. <i>britannicus</i> . An assessment of VU is based on long-term monitoring data collated by M. Rand (pers. comm.) that shows a c.30% decline in the number of extant locations. The native subspecies is near endemic at least, if not now endemic through the loss of similar plants in France.
		Arch	The decline of the archaeophyte has been masked by seeding of this taxon. The GB status has been retained pending an analysis of field data collected for the BSBI Threatened Plants Project in late 2014/early 2015.
	83		
	84		
			LC for the period 1930-1999 but a 51% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	99		
			Still under-recorded with a poorly documented distribution. The taxon may well have declined but a rigorous assessment of such trends is not possible for this List.
			The distribution and trends of this taxon are masked first by three erratically recorded subspecies and then by three erratically recorded taxa, but the AOO trend for the aggregate is likely to be relatively representative of this species.
			A 15% decline in AOO was measured for the aggregate.
			This taxon was not recorded consistently in the past and so trends cannot be interpreted with confidence. The collation of recent population data from all locations alongside repeat surveys are required to accurately determine a threat status.
	79		LC for the period 1930-1999 but a 46% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		
yes	100		The population estimate is based on a bootstrap of 20 quadrats recorded in 2013 across 15 10m grid squares, assuming 25% of grid cells had suitable habitat.
	81		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Helleborus viridis</i>	LC					N2			
LC	<i>Helminthotheca echioides</i> (<i>Picris echioides</i>)	LC								
LC	<i>Heracleum sphondylium</i>	LC								
DD	<i>Heracleum sphondylium</i> subsp. <i>flavescens</i>	DD								
VU	<i>Herminium monorchis</i>	EN	A2c AOO trend	54						
VU	<i>Herniaria ciliolata</i> subsp. <i>ciliolata</i>	NT	D				<10000			
LC	<i>Herniaria glabra</i>	LC								
EX	<i>Hieracium acamptum</i>	EX						yes		
LC	<i>Hieracium acroleucum</i> auct. <i>Angl.</i>	NT	D			8			probably	
LC	<i>Hieracium acuminatum</i>	LC								
CR	<i>Hieracium aequiserratum</i>	CR	D			3	6	yes		
VU	<i>Hieracium amnicola</i>	NT	D			8+		yes		
VU	<i>Hieracium ampliatiforme</i>	NT	D			9+		yes		
LC	<i>Hieracium ampliatum</i>	LC							yes	
LC	<i>Hieracium anglicum</i>	LC							yes	
LC	<i>Hieracium anglorum</i>	LC							yes	
VU	<i>Hieracium anguinum</i>	CR	B1a			1			probably	
DD	<i>Hieracium angustatum</i>	DD						yes		
LC	<i>Hieracium angustisquamum</i>	EN	B1a			5			yes	
VU	<i>Hieracium apiculatidens</i>	LC						yes		
LC	<i>Hieracium argenteum</i> auct. <i>Angl.</i>	LC							possibly	
VU	<i>Hieracium argutifolium</i>	NT	D			9			probably	
LC	<i>Hieracium auratiflorum</i>	LC							yes	
EN	<i>Hieracium bakeranum</i>	EN	B1a			4		yes		
LC	<i>Hieracium boreoanglicum</i>	LC							yes	
LC	<i>Hieracium boswellii</i>	EN	B1a			5			yes	
VU	<i>Hieracium brigantum</i>	LC						yes		
EN	<i>Hieracium britanniciforme</i>	DD				2			yes	
VU	<i>Hieracium britannicum</i>	DD						yes		
DD	<i>Hieracium caesionigrescens</i>	CR	D			2	very small		probably	
LC	<i>Hieracium caesiopilosum</i>	EN	B1a			5			yes	
VU	<i>Hieracium caesitium</i> auct. <i>Angl.</i>	EN	B1a			5			probably	
LC	<i>Hieracium calcaricola</i>	LC								

	International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
		92		Native or alien. The sole presumed native subspecies in England is <i>Helleborus viridis</i> subsp. <i>occidentalis</i> .
		89	Arch	
		100		
		100		
yes		100		Endemic: one locality, Witley, Surrey (extinct, last seen 1896); see Rich (2013a). Tyler (2014) regards the identification of this Scandinavian species in Britain as doubtful; it may be a new endemic.
				Much less frequent in England than Wales with only a few scattered records, and not recorded recently in Derbyshire.
yes		100		Endemic: known from three locations, but with only one recent record (2012); see Rich (2013a).
yes		100		Endemic: Malham-Arncliffe area, three recent records; see Rich (2013a).
yes		100		Endemic: Helvellyn and Fairfield, Ingleborough and Smardale Gill; four recent sites; see Rich (2013a).
yes		c. 90		Most frequent in N England on limestone.
yes				Frequent in N England on limestone, and widespread in Scotland, one old site in Wales.
yes				Widespread in England where it seems to be mostly an introduction (McCosh & Rich 2011). Eight locations in total, of which one is in England (McCosh & Rich 2011).
yes		100		Endemic: high altitude gullies in Cumbria; few recent sites and limited data; see Rich (2013a).
yes				Widely scattered and often only recorded once at each site, though abundant in a classic site at Cheddar (McCosh & Rich 2011).
yes		100		Endemic: Yorkshire Pennines; seen in many of its sites recently; see Rich (2013a).
		c.5		NW England, occasional to rare in the Lake District.
				Native at least in Worcestershire. Unknown outside UK other than one historic site in Ireland.
yes		94		
yes		100		Endemic: upper Teesdale; one new recent site, probably gone from three others; decline of >50% post-1960. See Rich (2013a).
		5		
		8		Only one recent record and decline of >50% detected post-1960.
yes		100		Endemic: Yorkshire Pennine Limestones where it is locally frequent; see Rich (2013a).
yes				Not looked for recently in its two Northumbrian sites (last seen at Norham in 1974); see Rich (2013a).
yes		100		No recent records, might be still relatively frequent in the Peak District but surveys needed.
		75		One precarious 'very small' population at Linton Falls, not refound on Ingleborough or Scotland (Rich 2013a). Tyler (2014) regards the identification of this Scandinavian species in Britain as doubtful; it may be a new endemic.
yes				Seen recently in two English sites but not recorded from three for many years.
		100		Tyler (2014) has queried the identification of British plants as this Scandinavian species; further study is required but it is probably a new endemic. There are two recent records.
		83		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
EX	<i>Hieracium cambricogothicum</i>	EX							Yes	
VU	<i>Hieracium candelabrae</i>	EN	B1a			4+		yes		
LC	<i>Hieracium cantianum</i>	EN	AOO trend			26+		yes		
LC	<i>Hieracium cerinthiforme</i>	EN	B1a			5			yes	
DD	<i>Hieracium chrysolorum</i>	DD				1			yes	
LC	<i>Hieracium cinderella</i>	LC							yes	
LC	<i>Hieracium clivicola</i>	RE							yes	
DD	<i>Hieracium commixtum</i>	DD				1				
LC	<i>Hieracium coniops auct. Angl.</i>	NT	D			6			probably	
LC	<i>Hieracium consociatum</i>	LC								
LC	<i>Hieracium cravoniense</i>	LC							yes	
VU	<i>Hieracium crebridens</i>	LC						yes		
LC	<i>Hieracium crebridentiforme</i>	LC						yes		
LC	<i>Hieracium crinellum</i>	LC							probably	
DD	<i>Hieracium cumbriense</i>	DD				4		yes		
EN	<i>Hieracium cuneifrons</i>	CR	A2; B1a			1			yes	
NT	<i>Hieracium cyathis</i>	EN	D			2	89		yes	
LC	<i>Hieracium cymbifolium</i>	LC							yes	
LC	<i>Hieracium daedalolepioides</i>	LC							probably	
DD	<i>Hieracium dalense</i>	DD				9+		yes		
LC	<i>Hieracium decolor</i>	LC						yes		
LC	<i>Hieracium deganwyense</i>	LC							yes	
NT	<i>Hieracium dentulum</i>	NT	D			19+		yes		
LC	<i>Hieracium diaphanoides</i>	LC								
LC	<i>Hieracium dicella</i>	LC							yes	
EN	<i>Hieracium dowardense</i>	CR	B1a; A2			2			yes	
LC	<i>Hieracium duriceps</i>	LC							yes	
LC	<i>Hieracium eboracense</i>	LC							yes	
EN	<i>Hieracium eminentiforme</i>	EN	AOO trend			8			yes	
VU	<i>Hieracium eustomon</i>	EN	AOO trend			8			yes	
DD	<i>Hieracium filisquamum</i>	CR	D			1	9	yes		
DD	<i>Hieracium fissuricola</i>	EX						yes		
LC	<i>Hieracium flocculosum</i>	LC							yes	

International responsibility?	Proportion (%) of GB hecads in England	Native_archaeophyte	Comments
yes			Not refound despite surveys, but doubt exists over identification of plants from the English sites (Rich <i>et al.</i> 2007).
yes	100		Endemic: Ingleborough, Pen-y-ghent and Whernside with two recent sites; see Rich (2013a).
yes	100		Endemic: Locally distributed in S. E. England. 13 recent tetrads in Philp (2010) with 4 older sites in Surrey and nine in Sussex for which there are no recent data. Decline of >50% post-1960 detected.
	3		No recent records in England for this scarce species of upland cliffs.
yes			Not searched for recently at Hen Hole (last recorded 1961); see Rich 2013a.
yes			
	10		One Herefordshire record 1896.
	100		Possibly native in Goring Gap. Last recorded 1961.
			Tyler (2014) has queried the identification of British plants as this Scandinavian species; further study is required.
yes			Frequent on limestone in N England.
yes	100		Endemic: Ingleborough, Giggleswick Scar and Kinsey Cave and Whernside, Lower Tweed and Whiteadder; three recent records (see Rich 2013a).
yes	100		Endemic: Frequent in N. W. England.
			Tyler (2014) regards the identification of this Scandinavian species in Britain as doubtful; it may be a new endemic.
yes	100		Endemic: four sites in Lake District but little recent information and not refound in Fisherplace Gill in 2013 (Rich 2013a, 2013b).
			One site at Red Darren, Herefordshire. Four sites in Wales (Rich 2010).
yes			86 plants Ubley Warren, but marked decline in Cheddar (Rich <i>et al.</i> 2008a; Rich 2013a).
yes			Mainly in N. W. England and Derbyshire, with a few sites in Scotland.
yes	100		Endemic: Peak District; in theory quite widespread but no recent searches so DD; see Rich (2013a).
yes	100		Endemic: Frequent on the Yorkshire limestone, and in Derbyshire and Westmorland.
	10		
yes	100		Derbyshire, Staffordshire, Westmorland; although quite widespread there are few recent records (Rich 2013a).
			Tyler (2014) has queried the identification of British plants as this Scandinavian species; further study is required.
yes	c.30		
yes			Decline of >80% post-1960 detected. The taxon has apparently gone from the Doward (its original site) and not seen recently at its other site at Capler Slip but there are two recent sites in Wales (Rich 2013a).
yes			
yes	c. 85		
yes	86		Appears to have declined markedly in S. W. England, with several recent unsuccessful searches of historic sites; still present in Wales (Rich 2013a).
yes			Searched for recently in several sites in S. W. England without success; still frequent in Wales (Rich 2013a).
yes	100		Endemic: Buttermere Fells; one possible population of nine plants refound at only site in 2013, confirmation awaiting flowering of cultivated material (Rich 2013b).
yes	100		Endemic: one square in Cumbria only, searched for in 2013 without success (Rich 2013b).
yes			Locally frequent in Yorkshire and Westmorland.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
DD	<i>Hieracium glanduliceps</i>	DD				4		yes		
LC	<i>Hieracium glevense</i>	EN	AOO trend			21			yes	
NT	<i>Hieracium holophyllum</i>	LC							yes	
LC	<i>Hieracium holosericeum</i>	EN	AOO trend			6			yes	
LC	<i>Hieracium hypochaeroides</i>	LC							yes	
VU	<i>Hieracium inaequilaterum</i>	NT	D			8		yes		
EN	<i>Hieracium integratum</i>	CR	D			4	<50		probably	
LC	<i>Hieracium iricum</i>	EN	AOO trend			8				
CR	<i>Hieracium itunense</i>	CR	D			1	30+	yes		
NT	<i>Hieracium jaculifolium</i>	NT	D			10+		yes		
LC	<i>Hieracium kentii</i>	LC						yes		
VU	<i>Hieracium lakelandicum</i>	NT	D			9		yes		
LC	<i>Hieracium lasiophyllum</i>	LC								
LC	<i>Hieracium latobrigorum</i>	LC								
VU	<i>Hieracium leyanum</i>	RE							yes	
LC	<i>Hieracium leyi</i>	LC							yes	
LC	<i>Hieracium lintonii</i>	LC							yes	
LC	<i>Hieracium lissolepium</i>	LC								
VU	<i>Hieracium lortetiae</i>	EN	B1a			4				
NT	<i>Hieracium maculoides</i>	NT	D			25+		yes		
EN	<i>Hieracium mammidens</i>	DD				6		yes?		
DD	<i>Hieracium megapodium</i>	DD				3		yes?		
DD	<i>Hieracium microspilum</i>	DD				4				
CR	<i>Hieracium mirandum</i>	CR	D			4	1	yes		
CR	<i>Hieracium naviense</i>	CR	B1a			1		yes		
LC	<i>Hieracium nemophilum</i>	LC								
LC	<i>Hieracium oistophyllum</i>	LC								
LC	<i>Hieracium orimeles</i>	LC							yes	
VU	<i>Hieracium ornatilorum</i>	EN	AOO trend			8		yes		
LC	<i>Hieracium oxybeles</i>	EN	B1a			3			yes	
CR	<i>Hieracium pachyphyloides</i>	CR	D			5	73		yes	
VU	<i>Hieracium peccense</i>	LC						yes		
LC	<i>Hieracium pellucidum</i>	LC								

International responsibility?	Proportion (%) of GB hecads in England	Native_archaeophyte	Comments
yes	100		Endemic: There is some taxonomic uncertainty about how uniform the material is; currently, based on a strict view of the taxon, it is recorded from Twistleton End Scar, Scar Close, Ingleborough and George's Scar, Kingsdale; see Rich (2013a). Last recorded in England in 1978 and 1994, probably declining markedly though still frequent in S. Wales.
			Often in small quantity.
yes	4		Only seen recently in two out of six sites in England (Tenant & Rich 2008).
yes			
yes	100		Endemic: West Yorkshire only with several recent records; see Rich (2013a).
	100		Populations of 15 and 'small and declining' at native sites, probably introduced in Notts and Durham (Rich 2013a). Tyler (2014) regards the identification of this Scandinavian species in Britain as doubtful; it may be a new endemic.
	3		Only one recent record from England, though common and widespread in Scotland.
yes	100		Endemic: very small population in gorge at Barras, second nearby site requires confirmation. About 30 plants seen in 2012 (Rich 2013a).
yes	100		Endemic: Cumbria and Yorkshire and being found increasingly widely now with a number of recent records with good populations; see Rich (2013a, 2013b).
yes	100		Very few recent records, last recorded 1996.
yes	100		Endemic: Cumbria only with recent records (Rich 2013a). Apparently locally frequent on hills in Shropshire.
	7		N. England, more widespread in Scotland. Not refound on only English site at Red Darren in 2005 (Rich <i>et al.</i> 2007).
yes			
yes	80		Frequent on limestone in N. England.
			Probably native in Herefordshire (last recorded 1903) and Wales, introduced elsewhere where there are recent records from Middlesex and Yorkshire (McCosh & Rich 2011).
yes	100		Endemic: Yorkshire and Cumbria only; see Rich (2013a).
yes	100		Probably endemic as unknown outside Britain. Last recorded in 1983 and not refound (Philp 2010).
yes	100		Probably endemic as unknown outside Britain. Last recorded in 1957; data required.
	80		Possibly native. One recent record from Devon.
yes	100		Endemic: Yorks/Cumbrian speciality, reduced to just one plant in West Cumbria; full history given in Rich & McCosh (2010) with updates in Rich (2013a, 2013b).
yes	100		Endemic: one site in Winnats Pass, Derbyshire where it was last recorded in 1966 but is probably still present (Rich 2013a). Probably under-recorded. Rather common in N. England.
yes	100		Endemic: Although known in about six sites in Yorkshire and Westmorland historically, it has not been refound in them but has been seen in two new sites recently, so better treated as Endangered due to decline rather than Vulnerable (Rich 2013a).
	2		Rare in England, though widespread in the Scottish uplands.
yes			Restricted to a few sites in the Wye Valley (though now gone from Wales). Threatened by woodland closure and public pressure (Sawtschuk & Rich 2008; Rich 2013a).
yes	100		Endemic: Derbyshire and Yorkshire, Hamps and Manifold Valleys, though with relatively little recent information (Rich 2013a).
	c. 75		Common on limestones in N. England.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
VU	<i>Hieracium peroblongum</i>	EN	B1a			3		Yes		
LC	<i>Hieracium piligerum</i>	CR	B1a			1			yes	
LC	<i>Hieracium placerophylloides</i>	LC							yes	
VU	<i>Hieracium pollichiae</i>	LC								
EN	<i>Hieracium portlandicum</i>	EN	D			3	103	yes		
LC	<i>Hieracium praesigne</i>	LC							yes	
LC	<i>Hieracium prenanthoides</i>	EN	AOO trend			27				
VU	<i>Hieracium prominentidens</i>	LC								
EN	<i>Hieracium promontoriale</i>	EN	B1a			2			yes	
VU	<i>Hieracium pulchrius</i>	CR	B1a			1			yes	
EX	<i>Hieracium pycnotrichum</i>	EX								
LC	<i>Hieracium reticulatifforme</i>	EN	B1a			5			yes	
NT	<i>Hieracium rhomboides auct. Angl.</i>	LC							probably	
LC	<i>Hieracium rigens</i>	EN	AOO trend			c. 50				
LC	<i>Hieracium rubicundiforme</i>	LC							yes	
LC	<i>Hieracium rubiginosum</i>	LC							yes	
LC	<i>Hieracium sabaudum</i>	LC								
LC	<i>Hieracium salticola</i>	LC								
LC	<i>Hieracium saxorum</i>	LC							yes	
LC	<i>Hieracium scabrisetum</i>	RE							yes	
LC	<i>Hieracium schmidtii</i>	EN	AOO trend			7				
LC	<i>Hieracium silvaticoides</i>	LC							yes	
EN	<i>Hieracium sinuolatum</i>	EN	B1a			3		yes		
LC	<i>Hieracium sparsifolium</i>	NT	D			17				
EN	<i>Hieracium stenolepiforme</i>	EN	D			2	57+	yes		
LC	<i>Hieracium stenopholidium</i>	NT	D			10			possibly	
LC	<i>Hieracium stenstroemii</i>	LC							possibly	
LC	<i>Hieracium stewartii</i>	CR	B1a			1			yes	
VU	<i>Hieracium stictum</i>	LC						yes		
LC	<i>Hieracium strictiforme</i>	LC								
LC	<i>Hieracium subamplifolium</i>	LC							yes	
VU	<i>Hieracium subbritannicum</i>	RE							yes	
LC	<i>Hieracium subcrocatum</i>	LC							yes	
LC	<i>Hieracium subcyaneum</i>	LC						yes		
EN	<i>Hieracium subgracilentipes</i>	EN	D			10	c. 101	yes		
EX	<i>Hieracium subintegrifolium</i>	EX						yes		

International responsibility?	Proportion (%) of GB hecads in England	Native _archaeophyte	Comments
yes	100		Endemic: Cumbria only. Abundant at the Coniston site but not recorded recently from the other two sites (Rich 2013a).
	1		One 1950s record from Northumberland only, though widespread in Scotland.
yes	c. 75		Frequent in N. England.
	100		Status uncertain but accepted as native in S. E. England. There are few recent records. See Rich (2013a).
yes	100		Endemic: Isle of Portland only where 103 plants have been recorded in two areas (in one of which it is declining) and it has not been refound at another (Rich <i>et al.</i> 2007; Rich 2013a).
yes	90		Frequent in N. England. Local in N. England.
	91		Accepted as native in coastal grasslands and woods, status uncertain for some other locations (Rich 2013a).
yes			A good population present at Humphrey Head (Rich 2013a). Most of the population is in Wales. Sole English locality is at Red Darren in the Black Mountains where the population is small (Rich 2013a).
	100		No longer present in either of its last two sites, where it was last seen in 1889 (Rich 2013a).
	5		Very scarce in N. England, more frequent in Scotland. One old record from Yorkshire, one 1984 record from Northumberland. Records from Pennines in Flora of Cumbria remain to be evaluated. Probably quite widespread but poorly known (Rich 2013a). Tyler (2014) regards the identification of this Scandinavian species in Britain as doubtful; it may be a new endemic.
	87		Probably native in S. E. England but introduced elsewhere, and relatively few recent records.
probably			Common and widespread (McCosh & Rich 2011). Possibly native in parts of S. E. England; locally frequent in some urban areas.
yes			
	1		One 1898 record from Yorkshire, probably extinct. Taxonomically unclear, taxon requires a revision including continental material (Rich 2013a).
yes	83		Frequent in N England.
yes	100		A probable English endemic, Yorkshire only and thriving at one site (McCosh & Rich 2011).
	7		Recorded in relatively few sites recently, and quite rare in N. England compared to Scotland.
yes	100		Endemic: Cheddar Gorge only where seen in two sites in 2000 (Rich 2013a). Usually in small quantity. The Icelandic material may be different. Few recent records in England. Tyler (2014) has queried the identification of British plants as this Scandinavian species; further study is required.
	6		One 2005 record from Yorkshire only.
yes	100		Endemic: Yorkshire limestone and Lancashire, with frequent recent records (Rich 2013a).
	c. 10		Occasional in N England. Scattered records in SW England, frequent in S Wales. Probably gone from Symonds Yat and the Great Doward as not seen recently, though still locally frequent in Wales (Moore 2009).
possibly			Widespread in N England.
yes	100		Frequent in Yorkshire and Westmorland.
yes	100		Endemic: Cumbria only with some recent records (Tennant & Rich 2008; Rich 2013a).
yes	100		Endemic: Probably extinct. Last recorded in 1950s and searched for unsuccessfully in 2013 (Rich 2013a, 2013b).

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
NT	<i>Hieracium sublasiophyllum</i>	NT	D			9				
LC	<i>Hieracium submutabile</i>	RE							yes	
DD	<i>Hieracium subplanifolium</i>	DD				8			yes	
VU	<i>Hieracium subprasiniifolium</i>	EN	B1a			5		yes?		
EN?	<i>Hieracium surrejanum</i>	NT	D			9		yes		
LC	<i>Hieracium trichocaulon</i>	LC								
LC	<i>Hieracium tricolorans</i>	LC						yes		
LC	<i>Hieracium triviale</i> auct. Angl.	RE								
LC	<i>Hieracium uiginskyense</i>	EN	B1a			5			yes	
LC	<i>Hieracium umbellatum</i> subsp. <i>bichlorophyllum</i>	LC								
LC	<i>Hieracium umbellatum</i> subsp. <i>umbellatum</i>	LC								
LC	<i>Hieracium vagense</i>	EN	B1a			4			yes	
EN	<i>Hieracium vagicola</i>	EN	D			1	126	yes		
LC	<i>Hieracium vagum</i>	LC								
LC	<i>Hieracium vennicontium</i>	NT	D			6			yes	
LC	<i>Hieracium virgultorum</i>	LC								
LC	<i>Hieracium vulgatum</i> auct. Angl.	LC								
LC	<i>Hierochloe odorata</i>	VU	D2			1				
NT	<i>Himantoglossum hircinum</i>	LC						N2		
LC	<i>Hippocrepis comosa</i>	LC						N2		
LC	<i>Hippophae rhamnoides</i>	LC								
LC	<i>Hippuris vulgaris</i>	LC								
LC	<i>Holcus lanatus</i>	LC								
LC	<i>Holcus mollis</i>	LC								
LC	<i>Honckenya peploides</i>	LC								
LC	<i>Hordelymus europaeus</i>	LC								
VU	<i>Hordeum marinum</i>	VU	A2c AOO trend	40						
LC	<i>Hordeum murinum</i>	LC								
LC	<i>Hordeum secalinum</i>	LC								
LC	<i>Hornungia petraea</i>	LC								
LC	<i>Hottonia palustris</i>	VU	A2c AOO and EOO trend	33	37					
LC	<i>Humulus lupulus</i>	LC								
LC	<i>Huperzia selago</i>	LC								
LC	<i>Hyacinthoides non-scripta</i>	LC								
VU	<i>Hydrilla verticillata</i>	RE								
VU	<i>Hydrocharis morsus-ranae</i>	VU	A2c AOO trend	46						

International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
	8		Relatively widespread with some recent records, and in Scotland (Rich 2013a). Possibly extinct, last recorded 1953. Still frequent in S. Wales.
			Gone from several sites in Wye Valley though still present in one, also known in four locations in Scotland and one in Wales (Rich 2013a).
yes	100		Probably endemic as unknown outside Britain.
yes	100		Endemic: Surrey and Sussex, with unconfirmed record from Kent ; there are few recent data but one recent Sussex site has over 200 plants (Rich 2013a).
	95		Frequent in S. E. England, scattered elsewhere.
yes	100		Frequent on limestone in N. England.
	9		One 1884 record from Shropshire. Tyler (2014) has pointed out that the name <i>H. neopinnatifidum</i> should be used for this taxon.
	6		Usually in very small quantity. Widespread in S.W. England.
	c. 75		Common and widespread.
yes			Four small populations in England.
yes	100		Endemic: Wye Valley (lower Wye gorge); see Sawtschuk & Rich (2008) and Rich (2013a). Common and widespread in N. England, scattered elsewhere.
	7		Only two recent records in England. A rare native in S. E. England where it is declining, introduced elsewhere.
			Common in N. England, rarer elsewhere. Tyler (2014) has pointed out that the name <i>H. triviale</i> (Norrl.) Norrl. should be used for this taxon.
	7		The population is probably derived from one or two clones (M. Braithwaite pers. comm.).
	100		LC for the period 1930-1999 but a 72% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	98		
	100		Found as an alien on Welsh and Scottish coasts, and occasionally inland areas.
	96		LC for the period 1930-1999 but a 37% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	94		
	92	Arch	The sole archaeophyte subspecies in England is <i>Hordeum murinum</i> subsp. <i>murinum</i> .
	95		
			LC for the period 1930-1999 but a 42% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	98		
	88		
			The sole native subspecies in England is <i>Huperzia selago</i> subsp. <i>selago</i> . LC for the period 1930-1999, but a 52% decline detected when assessing 1987+ data as a proportion of all records, including pre-1930 data. See Section 6.7.
	94		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Hydrocotyle vulgaris</i>	NT	A2c AOO trend	27						
LC	<i>Hymenophyllum tunbrigense</i>	LC								
NT	<i>Hymenophyllum wilsonii</i>	LC								
VU	<i>Hyoscyamus niger</i>	VU	A2c AOO and EOO trend	39	46					
LC	<i>Hypericum androsaemum</i>	LC								
LC	<i>Hypericum elodes</i>	NT	A2c AOO trend	24						
LC	<i>Hypericum hirsutum</i>	LC								
LC	<i>Hypericum humifusum</i>	LC								
NT	<i>Hypericum linariifolium</i>	LC								
LC	<i>Hypericum maculatum</i>	LC								
DD	<i>Hypericum maculatum</i> subsp. <i>maculatum</i>	DD								
LC	<i>Hypericum maculatum</i> subsp. <i>obtusiusculum</i>	LC								
NT	<i>Hypericum montanum</i>	LC								
LC	<i>Hypericum perforatum</i>	LC								
LC	<i>Hypericum pulchrum</i>	LC								
LC	<i>Hypericum tetrapterum</i>	LC								
LC	<i>Hypericum undulatum</i>	LC								
VU	<i>Hypochaeris glabra</i>	VU	A2c AOO trend	31						
NT	<i>Hypochaeris maculata</i>	VU	B2ab(iv)		6	c.300				
LC	<i>Hypochaeris radicata</i>	LC								
WL	<i>Hypochaeris radicata</i> subsp. <i>ericetorum</i>	WL								
LC	<i>Hypochaeris radicata</i> subsp. <i>radicata</i>	LC								
EN	<i>Hypopitys monotropa</i> (<i>Monotropa hypopitys</i>)	EN	A2c EOO trend	52						
LC	<i>Hypopitys monotropa</i> subsp. <i>hypophegea</i> (<i>Monotropa hypopitys</i> subsp. <i>hypophegea</i>)	EN								
LC	<i>Hypopitys monotropa</i> subsp. <i>monotropa</i> (<i>Monotropa hypopitys</i> subsp. <i>hypopitys</i>)	EN								
VU	<i>Iberis amara</i>	VU	A2c EOO trend	44			N2			
LC	<i>Ilex aquifolium</i>	LC								
EN	<i>Illecebrum verticillatum</i>	EN	A2ac AOO trend	48			N2			
LC	<i>Impatiens noli-tangere</i>	LC								

International responsibility?
 Proportion (%) of GB hecctads in England
 Native_archaeophyte

Comments

			LC for the period 1930-1999 but a 35% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	10		LC for the period 1930-1999 but a 44% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	87	Arch	
	possibly		
	83		
	78		LC for the period 1930-1999 but a 35% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	80		Assumed LC as species. LC for the period 1930-1999 but a 46% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	78		
	88		
	90		Lost from two locations post-2000, and is close to EN status based on the number of mature individuals (Criterion D).
			Further work on taxonomy and distribution limits required.
	86		Assumed LC as species.
			Assumed EN as species.
			Assumed EN as species.
	100		
	100		The indisputably native populations in Cornwall have shown a prolonged and continuing decline. In the New Forest, where first recorded in 1925, it is still increasing. In N. Hants, where first found in 2005, it has rapidly increased on sandy tracks used by the military training vehicles which are believed to have been its means of introduction and subsequent dispersal.
	75		LC for the period 1930-1999 but a 56% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
NT	<i>Imperatoria ostruthium</i> (<i>Peucedanum ostruthium</i>)	LC								
LC	<i>Inula conyzae</i>	LC								
LC	<i>Inula crithmoides</i>	LC								
LC	<i>Inula helenium</i>	NT	A2c EOO trend		26					
LC	<i>Iris foetidissima</i>	LC					N2			
LC	<i>Iris pseudacorus</i>	LC								
LC	<i>Isatis tinctoria</i>	LC								
LC	<i>Isoetes echinospora</i>	LC								
VU	<i>Isoetes histrix</i>	VU	B1ac + 2ac		<10		N2			
LC	<i>Isoetes lacustris</i>	LC								
LC	<i>Isolepis cernua</i>	LC								
LC	<i>Isolepis setacea</i>	LC								
LC	<i>Jasione montana</i>	VU	A2c AOO trend	39						
LC	<i>Juncus acutiflorus</i>	LC								
LC	<i>Juncus acutus</i>	LC								
LC	<i>Juncus alpinoarticulatus</i>	LC								
LC	<i>Juncus articulatus</i>	LC								
LC	<i>Juncus balticus</i>	VU	D1; D2		3	86 'patches'				
LC	<i>Juncus bufonius</i> s.l.	LC								
LC	<i>Juncus bulbosus</i>	LC								
LC	<i>Juncus bulbosus</i> subsp. <i>bulbosus</i>	LC								
LC	<i>Juncus bulbosus</i> subsp. <i>kochii</i>	LC								
VU	<i>Juncus capitatus</i>	EN	A2c AOO trend; B1bc(iv) +2 bc(iv); C2a(i)	>50		17	228			
NT	<i>Juncus compressus</i>	VU	A2c AOO and EOO trend	34	37					
LC	<i>Juncus conglomeratus</i>	LC								
LC	<i>Juncus effusus</i>	LC								
LC	<i>Juncus filiformis</i>	LC								
LC	<i>Juncus foliosus</i>	LC								
LC	<i>Juncus gerardii</i>	LC								
LC	<i>Juncus inflexus</i>	LC								
LC	<i>Juncus maritimus</i>	LC								
EN	<i>Juncus pygmaeus</i>	EN	A2ac AOO trend	>50		12	1000- 1500			
LC	<i>Juncus ranarius</i> (<i>Juncus</i> <i>ambiguus</i>)	LC								
LC	<i>Juncus squarrosus</i>	LC								
LC	<i>Juncus subnodulosus</i>	LC								
LC	<i>Juncus triglumis</i>	LC								

International responsibility?	Proportion (%) of GB hectads in England	Native archaeophyte	Comments
	90	Arch	LC for the period 1930-1999 but a 60% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	91	Arch	
	94	Arch	LC for the period 1930-1999 but a 57% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	10		
	100		See Section 7 for an explanation of the threat status.
	5		LC for the period 1930-1999 but a 39% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			The sole native subspecies in England is <i>Juncus alpinoarticulatus</i> subsp. <i>alpinoarticulatus</i> .
	2		
			Assumed LC as species.
			Assumed LC as species.
			An annual plant with fluctuating numbers from year to year. The most recent count in 2012 suggests the species may also qualify for EN based on criterion D if short-term trends continue.
	96		
	82		
	100		Approximately 50% of locations have been lost due to scrub encroachment or track surfacing. The count of mature individuals is based on data collected between 1980 and 2013.
	86		
	7		LC for the period 1930-1999 but a 31% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Juniperus communis</i>	NT	A2c AOO and EOO trend	20	24					
LC	<i>Juniperus communis</i> subsp. <i>communis</i>	NT								
CR	<i>Juniperus communis</i> subsp. <i>hemisphaerica</i>	CR	D			1	13			
LC	<i>Juniperus communis</i> subsp. <i>nana</i>	DD								
LC	<i>Kickxia elatine</i>	LC								
LC	<i>Kickxia spuria</i>	LC								
LC	<i>Knautia arvensis</i>	NT	A2c AOO trend	23						
LC	<i>Kobresia simpliciuscula</i>	LC								
LC	<i>Koeleria macrantha</i>	LC								
VU	<i>Koeleria vallesiana</i>	NT	D			10	<10000	N2		
EN	<i>Lactuca saligna</i>	EN	B1ac(iv) + B2ac(iv)			3		N2		
LC	<i>Lactuca serriola</i>	LC								
LC	<i>Lactuca virosa</i>	LC								
LC	<i>Lamiaeum galeobdolon</i>	LC								
VU	<i>Lamiaeum galeobdolon</i> subsp. <i>galeobdolon</i>	VU	D2			3				
LC	<i>Lamiaeum galeobdolon</i> subsp. <i>montanum</i>	LC								
LC	<i>Lamium album</i>	LC								
LC	<i>Lamium amplexicaule</i>	LC								
LC	<i>Lamium confertum</i>	EN	A2c EOO trend		61					
LC	<i>Lamium hybridum</i>	LC								
LC	<i>Lamium purpureum</i>	LC								
LC	<i>Lapsana communis</i>	LC								
LC	<i>Lathraea squamaria</i>	LC								
VU	<i>Lathyrus aphaca</i>	VU	A2c AOO trend	31				N2		
WL	<i>Lathyrus hirsutus</i>	WL								
LC	<i>Lathyrus japonicus</i>	LC								
LC	<i>Lathyrus linifolius</i>	NT	A2c AOO trend	29						
LC	<i>Lathyrus nissolia</i>	LC						N2		
NT	<i>Lathyrus palustris</i>	NT	B			<30				
LC	<i>Lathyrus pratensis</i>	LC								
LC	<i>Lathyrus sylvestris</i>	LC								
EN	<i>Leersia oryzoides</i>	EN	A2c AOO trend	53						
LC	<i>Legousia hybrida</i>	LC								
LC	<i>Lemna gibba</i>	LC								
LC	<i>Lemna minor</i>	LC								
LC	<i>Lemna trisulca</i>	LC								

International responsibility?
 Proportion (%) of GB hecctads in England
 Native_archaeophyte

Comments

				Assumed NT as species.
		90	Arch	
		98	Arch	
		82		
		100		
		100		
		92	Arch	
		96		
		86		
		100		May be overlooked due to similarity to the widespread subsp. <i>montanum</i> .
				Assumed LC as species.
		79	Arch	
		79	Arch	
		4	Arch	
		80	Arch	
			Arch	
				Native or alien.
		79		
		100		Native or alien.
				A casual species in most of the UK, it may have some claim to native status near to the Thames estuary. It is rare and declining in northern France.
		88		The sole native subspecies in England is <i>Lathyrus japonicus</i> subsp. <i>maritimus</i> . LC for the period 1930-1999, but a 47% decline detected when assessing 1987+ data as a proportion of all records, including pre-1930 data. See Section 6.7.
		95		
		77		
		78		LC for the period 1930-1999 but a 42% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
		100		
		99	Arch	LC for the period 1930-1999 but a 39% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
		94		
		88		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Lemna turionifera</i>	LC								
LC	<i>Leontodon hispidus</i>	LC								
LC	<i>Leontodon saxatilis</i>	LC								
LC	<i>Lepidium campestre</i>	NT	A2c AOO trend	21						
LC	<i>Lepidium heterophyllum</i>	LC								
LC	<i>Lepidium latifolium</i>	LC								
LC	<i>Lepidium rudérale</i>	LC								
LC	<i>Lepidium squamatum</i> (<i>Coronopus squamatus</i>)	LC								
LC	<i>Leucanthemum vulgare</i>	LC								
LC	<i>Leucojum aestivum</i>	LC								
LC	<i>Leymus arenarius</i>	LC								
LC	<i>Ligusticum scoticum</i>	EN	B1ab(iv) + 2ab(iv)			3	S2			
LC	<i>Ligustrum vulgare</i>	LC								
LC	<i>Limonium bellidifolium</i>	LC					N2			
WL	<i>Limonium binervosum</i>	WL								
LC	<i>Limonium binervosum</i> agg.	LC								
WL	<i>Limonium binervosum</i> subsp. <i>anglicum</i>	WL						yes		
WL	<i>Limonium binervosum</i> subsp. <i>binervosum</i>	WL								
WL	<i>Limonium binervosum</i> subsp. <i>cantianum</i>	WL						yes		
WL	<i>Limonium binervosum</i> subsp. <i>mutatum</i>	WL						yes		
WL	<i>Limonium binervosum</i> subsp. <i>saxonicum</i>	WL						yes		
WL	<i>Limonium britannicum</i>	WL								
WL	<i>Limonium britannicum</i> subsp. <i>britannicum</i>	WL						yes		
WL	<i>Limonium britannicum</i> subsp. <i>celticum</i>	WL								
WL	<i>Limonium britannicum</i> subsp. <i>coombense</i>	WL						yes		
WL	<i>Limonium britannicum</i> subsp. <i>transcanalis</i>	WL								
WL	<i>Limonium dodartiforme</i>	WL						yes		
LC	<i>Limonium humile</i>	LC								
WL	<i>Limonium loganicum</i>	WL						yes		
WL	<i>Limonium paradoxum</i>	WL								
WL	<i>Limonium parvum</i>	WL								
WL	<i>Limonium procerum</i>	WL								
WL	<i>Limonium procerum</i> subsp. <i>devoniense</i>	WL						yes		

International responsibility?	Proportion (%) of GB hectads in England	Native_archaeophyte	Comments
			Native or alien.
	80		
	80		
	91	Arch	
			LC for the period 1930-1999 but a 38% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	98		
	97	Arch	LC for the period 1930-1999 but a 34% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
		Arch	
			The sole native subspecies in England is <i>Leucanthemum vulgare</i> subsp. <i>vulgare</i> .
	100		The sole native subspecies in England is <i>Leucanthemum vulgare</i> subsp. <i>vulgare</i> .
	1		
	88		
	100		
yes			Taxonomic work awaited.
yes			
yes	100		Taxonomic work awaited.
			Taxonomic work awaited.
yes	100		Taxonomic work awaited.
yes	100		Taxonomic work awaited.
yes	100		Taxonomic work awaited.
			Taxonomic work awaited.
yes	100		Taxonomic work awaited.
			Taxonomic work awaited.
yes	100		Taxonomic work awaited.
possibly			
yes	100		Taxonomic work awaited.
			Taxonomic work awaited.
			Taxonomic work awaited.
yes	100		Taxonomic work awaited.

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GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
WL	<i>Limonium procerum</i> subsp. <i>procerum</i>	WL								
VU	<i>Limonium recurvum</i>	VU	D2			5			yes	
WL	<i>Limonium recurvum</i> subsp. <i>humile</i>	WL								
WL	<i>Limonium recurvum</i> subsp. <i>portlandicum</i>	WL							yes	
WL	<i>Limonium recurvum</i> subsp. <i>recurvum</i>	WL							yes	
LC	<i>Limonium vulgare</i>	NT	A2c AOO trend	24						
LC	<i>Limosella aquatica</i>	LC								
LC	<i>Linaria repens</i>	LC								
LC	<i>Linaria vulgaris</i>	LC								
LC	<i>Linum bienne</i>	LC								
LC	<i>Linum catharticum</i>	LC								
LC	<i>Linum perenne</i>	LC							yes	
EN	<i>Liparis loeselii</i>	EN	A2c AOO trend	79	5	>10000				
EN	<i>Lithospermum arvense</i>	EN	A2c AOO trend	54						
LC	<i>Lithospermum officinale</i>	LC								
LC	<i>Lithospermum purpureocaeruleum</i>	LC								
LC	<i>Littorella uniflora</i>	LC								
LC	<i>Lobelia dortmanna</i>	LC								
VU	<i>Lobelia urens</i>	VU	A2c AOO trend	49			N2			
LC	<i>Lolium perenne</i>	LC								
CR	<i>Lolium temulentum</i>	CR	A2c AOO trend	88	1?					
LC	<i>Lonicera periclymenum</i>	LC								
NT	<i>Lotus angustissimus</i>	NT	B		<30					
LC	<i>Lotus corniculatus</i>	LC								
LC	<i>Lotus pedunculatus</i>	LC								
LC	<i>Lotus subbiflorus</i>	LC								
LC	<i>Lotus tenuis</i> (<i>Lotus glaber</i>)	LC								
LC	<i>Ludwigia palustris</i>	LC					N2			
LC	<i>Luronium natans</i>	NT	A2c EOO trend	33						
LC	<i>Luzula campestris</i>	LC								
LC	<i>Luzula forsteri</i>	LC								

International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
			Taxonomic work awaited.
	75		
			Taxonomic work awaited.
	100		Taxonomic work awaited.
yes	100		Taxonomic work awaited.
	80		
			LC for the period 1930-1999 but a 62% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
		Arch	
	75		
	81		LC for the period 1930-1999 but a 36% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
yes	96		The sole native subspecies in England is <i>Linum perenne</i> subsp. <i>anglicum</i> . LC for the period 1930-1999, but a 45% decline detected when assessing 1987+ data as a proportion of all records, including pre-1930 data. See Section 6.7. The threat status reflects historical losses since 1930. In the past five years, focused conservation effort has led to an increase in numbers as well as the discovery of new sub-populations, and if these positive trends continue then the status should be downgraded to VU at the next assessment.
	98	Arch	
	92		LC for the period 1930-1999 but a 35% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			LC for the period 1930-1999 but a 43% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			LC for the period 1930-1999 but a 40% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	4		
	100		
	83	Arch	The AOO figure does not include post-1999 records and is probably an underestimate of decline, with potentially just one extant archaeophyte location remaining (Walker & Pearman 2012).
	100		A repeat survey of locations is desirable to assess post-2000 trends.
	96		
	98		LC for the period 1930-1999 but a 43% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		LC for the period 1930-1999 but a 47% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
possibly			The EOO decline meets VU status, but the submerged form is easily overlooked. As EOO is not corrected for recorder effort the status has been downgraded to NT.
	97		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Luzula multiflora</i>	LC								
LC	<i>Luzula multiflora</i> subsp. <i>congesta</i>	LC								
LC	<i>Luzula multiflora</i> subsp. <i>multiflora</i>	LC								
CR	<i>Luzula pallescens</i> (<i>Luzula pallidula</i>)	CR	D			2	<50			
LC	<i>Luzula pilosa</i>	LC								
LC	<i>Luzula sylvatica</i>	LC								
EN	<i>Lycopodiella inundata</i>	EN	A2c EOO trend	65						
LC	<i>Lycopodium annotinum</i>	VU	D2			3				
LC	<i>Lycopodium clavatum</i>	VU	A2c AOO trend	31						
LC	<i>Lycopus europaeus</i>	LC								
LC	<i>Lysimachia nemorum</i>	LC								
LC	<i>Lysimachia nummularia</i>	LC								
LC	<i>Lysimachia thyrsoiflora</i>	CR	B1ab(i-v) +2ab(i-v)			1				
LC	<i>Lysimachia vulgaris</i>	LC								
EN	<i>Lythrum hyssopifolia</i>	EN	A2c AOO trend	62						
LC	<i>Lythrum portula</i>	LC								
LC	<i>Lythrum salicaria</i>	LC								
VU	<i>Maianthemum bifolium</i>	VU	D2			3				
LC	<i>Malus sylvestris</i> s.s.	LC								
LC	<i>Malva arborea</i> (<i>Lavatera arborea</i>)	LC								
LC	<i>Malva moschata</i>	LC								
LC	<i>Malva neglecta</i>	LC								
LC	<i>Malva sylvestris</i>	LC								
LC	<i>Marrubium vulgare</i>	LC								
LC	<i>Matricaria chamomilla</i> (<i>Matricaria recutita</i>)	LC								
VU	<i>Matthiola sinuata</i>	VU	D2			3	c.3500			
LC	<i>Meconopsis cambrica</i>	LC								
LC	<i>Medicago arabica</i>	LC					N2			
LC	<i>Medicago lupulina</i>	LC								
VU	<i>Medicago minima</i>	VU	A2c AOO trend	44						
LC	<i>Medicago polymorpha</i>	LC					N2			
LC	<i>Medicago sativa</i>	LC								
EN	<i>Melampyrum arvense</i>	EN	D			4	<250			
VU	<i>Melampyrum cristatum</i>	EN	A2c AOO and EOO trend	60	69					
LC	<i>Melampyrum pratense</i>	NT	A2c AOO trend	28						

International responsibility?	Proportion (%) of GB hectads in England	Native/archaeophyte	Comments
			Assumed LC as species.
			Assumed LC as species.
	100		Sub-populations fluctuate between years, but the most recent counts from the past 10 years total only eight plants.
	1		
	87		
	6		Lost from one of the two native England locations. Plants at the sole extant location are vulnerable to visitor pressure.
	80		
	86	Arch	The threat status is based on historical decline since 1930. Seeds of <i>L. hyssopifolia</i> are long-lived and may germinate from the seed bank after many years of absence in the above-ground vegetation.
	100		
	85		
	91	Arch	
	80	Arch	
	76		LC for the period 1930-1999 but a 77% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	83	Arch	
			Native or alien.
	95		
	75		
	100		
	99		LC for the period 1930-1999 but a 50% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		The sole native subspecies in England is <i>Medicago sativa</i> subsp. <i>falcata</i> . LC for the period 1930-1999, but a 63% decline detected when assessing 1987+ data as a proportion of all records, including pre-1930 data. See Section 6.7.
		Arch	
	100		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
WL	<i>Melampyrum pratense</i> subsp. <i>commutatum</i>	WL								
WL	<i>Melampyrum pratense</i> subsp. <i>pratense</i>	WL								
EN	<i>Melampyrum sylvaticum</i>	RE								
LC	<i>Melica nutans</i>	LC								
LC	<i>Melica uniflora</i>	LC								
LC	<i>Melilotus altissimus</i>	LC								
VU	<i>Melittis melissophyllum</i>	VU	A2c AOO trend	35						
LC	<i>Mentha aquatica</i>	LC								
LC	<i>Mentha arvensis</i>	NT	A2c AOO trend	25						
EN	<i>Mentha pulegium</i>	CR	A2c AOO trend	84						
LC	<i>Mentha spicata</i>	LC								
DD	<i>Mentha suaveolens</i>	NT	A2c AOO and EOO trend	32	32					
LC	<i>Menyanthes trifoliata</i>	LC								
LC	<i>Mercurialis annua</i>	LC								
LC	<i>Mercurialis perennis</i>	LC								
NT	<i>Mertensia maritima</i>	RE								
LC	<i>Mespilus germanica</i>	LC								
NT	<i>Meum athamanticum</i>	LC								
LC	<i>Mibora minima</i>	NT	D			1	<10000	N2		
VU	<i>Microthlaspi perfoliatum</i> (<i>Thlaspi perfoliatum</i>)	VU	C2a(i)			16?				
LC	<i>Milium effusum</i>	LC								
EN	<i>Minuartia hybrida</i>	EN	A2c EOO trend		65			N2		
VU	<i>Minuartia stricta</i>	EN	A2a AOO trend	>50			133 (317)			
NT	<i>Minuartia verna</i>	LC								
VU	<i>Misopates orontium</i>	VU	A2c AOO trend	35						
LC	<i>Moehringia trinervia</i>	LC								
LC	<i>Moenchia erecta</i>	VU	A2c EOO trend		47					
LC	<i>Molinia caerulea</i>	LC								
WL	<i>Molinia caerulea</i> subsp. <i>arundinacea</i>	WL								
LC	<i>Molinia caerulea</i> subsp. <i>caerulea</i>	LC								
LC	<i>Montia fontana</i>	LC								
WL	<i>Montia fontana</i> subsp. <i>amporitana</i>	WL								
LC	<i>Montia fontana</i> subsp. <i>chondrosperma</i>	LC								

International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
			Insufficient mapping data.
			Insufficient mapping data.
			Extinct in England. See Section 6.4.
			LC for the period 1930-1999 but a 41% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	75		
	91	Arch	
	92		
	97		Every effort has been made to exclude alien records of this taxon.
		Arch	
			The true status of the species is obscured by garden escapes and over-recording between 1930 and 1969. Consequently the status has been downgraded from VU to NT.
	95	Arch	
			Not recorded in England since 1995, but present in the south west of Scotland and the Isle of Man, so re-colonisation of the English (and Welsh) coastline is possible.
	96	Arch	LC for the period 1930-1999 but a 35% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	9		LC for the period 1930-1999 but a 62% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			The Dorset locality for this species is not considered to be native, and so only assumed native Lancashire population is included in the threat assessment.
	100		
	79		
	99		The sole native subspecies in England is <i>Minuartia hybrida</i> subsp. <i>tenuifolia</i> . The AOO analysis measured a decline of 48%, very close to the EN threshold of 50% decline exceeded by the EOO trend.
	100		Survey results suggest a c.50% decline in the population since the late 1990s. The population estimate is from 2013, and the 30 year mean is in brackets.
	75		
	84	Arch	
	83		
			Insufficient mapping data.
			Assumed LC as species.
			Insufficient mapping data and more taxonomic work required.
			Assumed LC as species.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Montia fontana</i> subsp. <i>fontana</i>	LC								
WL	<i>Montia fontana</i> subsp. <i>variabilis</i>	WL								
VU	<i>Muscari neglectum</i>	WL					N2			
LC	<i>Mycelis muralis</i>	LC								
NT	<i>Myosotis alpestris</i>	VU	D2			3	>10000			
LC	<i>Myosotis arvensis</i>	LC								
LC	<i>Myosotis discolor</i>	LC								
LC	<i>Myosotis laxa</i>	LC								
LC	<i>Myosotis ramosissima</i>	LC								
LC	<i>Myosotis scorpioides</i>	LC								
LC	<i>Myosotis secunda</i>	LC								
LC	<i>Myosotis stolonifera</i>	LC								
LC	<i>Myosotis sylvatica</i>	LC								
LC	<i>Myosoton aquaticum</i>	LC								
VU	<i>Myosurus minimus</i>	VU	A2c EOO trend		33					
LC	<i>Myrica gale</i>	NT	A2c AOO trend	23						
LC	<i>Myriophyllum alterniflorum</i>	LC								
LC	<i>Myriophyllum spicatum</i>	LC								
VU	<i>Myriophyllum verticillatum</i>	NT	A2c AOO trend	29						
LC	<i>Najas flexilis</i>	RE								
VU	<i>Najas marina</i>	VU	D2			5				
LC	<i>Narcissus pseudonarcissus</i>	LC								
LC	<i>Nardus stricta</i>	NT	A2c AOO trend	23						
LC	<i>Narthecium ossifragum</i>	LC								
LC	<i>Nasturtium microphyllum</i> (<i>Rorippa microphylla</i>)	LC								
LC	<i>Nasturtium officinale</i> (<i>Rorippa nasturtium-aquaticum</i>)	LC								
LC	<i>Nasturtium officinale</i> agg. (<i>Rorippa nasturtium-aquaticum</i> agg.)	LC								
EN	<i>Neotinea ustulata</i> (<i>Orchis ustulata</i>)	EN	A2c AOO trend	>50						
LC	<i>Neottia cordata</i> (<i>Listera cordata</i>)	LC								
NT	<i>Neottia nidus-avis</i>	VU	A2c AOO trend	32						
LC	<i>Neottia ovata</i> (<i>Listera ovata</i>)	LC								
VU	<i>Nepeta cataria</i>	VU	A2c AOO trend	34						
LC	<i>Noccaea caerulescens</i> (<i>Thlaspi caerulescens</i>)	LC								
LC	<i>Nuphar lutea</i>	LC								
LC	<i>Nuphar pumila</i>	CR	D			1	<50			
LC	<i>Nymphaea alba</i>	LC								

International responsibility?	Proportion (%) of GB hectads in England	Native/archaeophyte	Comments
			Assumed LC as species.
			Insufficient mapping data and more taxonomic work required.
	100		Placed on the WL following conclusions regarding its native/alien status in Pearman (2013).
	78		
			Extant sub-populations are vulnerable to changes in grazing regimes and may also be adversely affected by prolonged changes in climate that result in warmer average winter temperatures.
		Arch	
			The sole native subspecies in England is <i>Myosotis laxa</i> subsp. <i>caespitosa</i> .
	82		
possibly	87		
	76		
	96		
	98		
			LC for the period 1930-1999 but a 43% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	78		
	99		
			Gone from its sole England location at Esthwaite Water. See Section 6.4.
	100		
	93		The sole native subspecies in England is <i>Narcissus pseudonarcissus</i> subsp. <i>pseudonarcissus</i> .
	98		GB threat status (>50% decline in AOO) retained for this England-only taxon, but examination of trends post-1999 are urgently required and may reveal greater losses.
			LC for the period 1930-1999 but a 53% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	76		
	96	Arch	
	78		
	79		
	2		Two 'patches' present in 2011 (A. Lockton pers. comm.). The sole native subspecies in England is <i>Nymphaea alba</i> subsp. <i>alba</i> .

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Nymphoides peltata</i>	LC								
LC	<i>Odontites vernus</i>	LC								
LC	<i>Odontites vernus</i> subsp. <i>litoralis</i>	DD								
LC	<i>Odontites vernus</i> subsp. <i>serotinus</i>	LC								
LC	<i>Odontites vernus</i> subsp. <i>vernus</i>	LC								
LC	<i>Oenanthe aquatica</i>	LC								
LC	<i>Oenanthe crocata</i>	LC								
LC	<i>Oenanthe fistulosa</i>	VU	A2c AOO trend	35						
LC	<i>Oenanthe fluviatilis</i>	LC								
LC	<i>Oenanthe lachenalii</i>	NT	A2c AOO trend	24						
LC	<i>Oenanthe pimpinelloides</i>	LC						N2		
NT	<i>Oenanthe silaifolia</i>	LC						N2		
NT	<i>Onobrychis viciifolia</i>	VU	A2c AOO and EOO trend	35	31					
WL	<i>Onobrychis viciifolia</i> subsp. <i>collina</i>	WL								
LC	<i>Ononis reclinata</i>	VU	D1; D2			4	c.350			
LC	<i>Ononis repens</i>	LC								
LC	<i>Ononis spinosa</i>	NT	A2c AOO trend	25						
LC	<i>Onopordum acanthium</i>	LC								
LC	<i>Ophioglossum azoricum</i>	LC								
VU	<i>Ophioglossum lusitanicum</i>	VU	D1			1	<1000	N1		
LC	<i>Ophioglossum vulgatum</i>	LC								
LC	<i>Ophrys apifera</i>	LC								
VU	<i>Ophrys fuciflora</i>	VU	D1				c.360			
VU	<i>Ophrys insectifera</i>	VU	A2c AOO trend	37						
LC	<i>Ophrys sphegodes</i>	LC						N2		
EN	<i>Orchis anthropophora</i> (<i>Aceras anthropophorum</i>)	EN	A2a AOO and EOO trend	>50				N2		
LC	<i>Orchis mascula</i>	LC								
VU	<i>Orchis militaris</i>	VU	D1			3	c.1000			
EN	<i>Orchis purpurea</i>	VU	A2c AOO and EOO trend	44	34					
VU	<i>Orchis simia</i>	VU	D1			2	372	N2		
LC	<i>Oreopteris limbosperma</i>	LC								
LC	<i>Origanum vulgare</i>	LC								

International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
	100		
			Population data required for threat assessment.
			Assumed LC as species.
			Assumed LC as species.
	94		LC for the period 1930-1999 but a 36% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	91		
possibly	100		LC for the period 1930-1999 but a 42% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7. The main losses have been of inland subpopulations.
	99		
	100		No significant and substantial (greater than 20%) decline detected. The New Atlas account states that new locations have been discovered since the first Atlas, and it is possible that this species is a beneficiary of agri-environment schemes, but more information is required to substantiate this assertion.
	100		
			Taxonomic and distributional limits unclear.
			The population estimate is derived from recent (post-1999) records.
	77		
	96		
	92	Arch	
	100		
	94		
	100		The population estimate is derived from recent (post-1999) records.
	97		
	100		LC for the period 1930-1999 but a 70% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		
	100		Population estimate for 2013 was 1018 flowering spikes. A precautionary approach based on the small number of locations and past (recent) counts of considerably fewer than 1000 spikes resulted in a VU assessment.
	100		A confidence level of 90% was accepted for the AOO trend.
	100		The count of spikes from the location which holds c.93% of the England population was calculated by taking the 10 year mean (2003-2013). A third location where <i>O. simia</i> was successfully introduced is excluded from the analysis for the reasons outlined in Section 4.5.
	80		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Ornithogalum pyrenaicum</i>	LC					N2			
LC	<i>Ornithogalum umbellatum</i>	LC								
LC	<i>Ornithopus perpusillus</i>	LC								
LC	<i>Ornithopus pinnatus</i>	LC					N1			
LC	<i>Orobanchе alba</i>	LC								
NT	<i>Orobanchе caryophyllacea</i>	NT	D				<10000			
LC	<i>Orobanchе elatior</i>	LC								
LC	<i>Orobanchе hederae</i>	LC								
LC	<i>Orobanchе minor</i>	LC								
LC	<i>Orobanchе minor</i> subsp. <i>maritima</i>	LC								
LC	<i>Orobanchе minor</i> subsp. <i>minor</i>	LC								
EN	<i>Orobanchе picridis</i> (<i>Orobanchе artemisiae-campestris</i>)	VU	D1; D2			5	c.500			
VU	<i>Orobanchе purpurea</i>	VU	D1				<1000			
NT	<i>Orobanchе rapum-genistae</i>	VU	A2c AOO trend	41						
NT	<i>Orobanchе reticulata</i>	NT	D				<10000			
LC	<i>Orthilia secunda</i>	NT	D			c.15	c.2500			
LC	<i>Osmunda regalis</i>	LC								
LC	<i>Oxalis acetosella</i>	NT	A2c AOO trend	20						
LC	<i>Oxyria digyna</i>	LC								
WL	<i>Pancratium maritimum</i>	WL								
VU	<i>Papaver argemone</i>	EN	A2c AOO trend	51						
EX	<i>Papaver bivalve</i> (<i>Roemeria hybrida</i>)	EX								
LC	<i>Papaver dubium</i> (<i>Papaver dubium</i> subsp. <i>dubium</i>)	LC								
LC	<i>Papaver hybridum</i>	LC								
LC	<i>Papaver lecoqii</i> (<i>Papaver dubium</i> subsp. <i>lecoqii</i>)	LC								
LC	<i>Papaver rhoeas</i>	LC								
LC	<i>Papaver somniferum</i>	LC								
LC	<i>Parapholis incurva</i>	LC								
LC	<i>Parapholis strigosa</i>	LC								
LC	<i>Parentucellia viscosa</i>	LC								
LC	<i>Parietaria judaica</i>	LC								
LC	<i>Paris quadrifolia</i>	LC								
LC	<i>Parnassia palustris</i>	VU	A2c AOO and EOO trend	39	39					
LC	<i>Pastinaca sativa</i>	LC								

International responsibility?	Proportion (%) of GB hectads in England	Native_ archaeophyte	Comments
	100		
	100		
	100		LC for the period 1930-1999 but a 59% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		The GB status is retained for this England-only taxon. An intensive survey of this taxon started in 2013 and is ongoing.
	100		LC for the period 1930-1999 but a 31% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	94		
			Assumed LC as species.
			Assumed LC as species.
	100		Population estimate is based on count data collated from 2000-2012.
	94		A repeat survey is desirable to ascertain a contemporary population estimate and may lead to an upgrading of threat status to EN based on Criterion D.
	100		
	6		
	4		
	100		It is not yet clear if this species is a natural colonist or introduction.
	93	Arch	Marginal EN based on AOO. EOO trend showed a decline of 39% (VU).
		Arch	The sole archaeophyte subspecies in England was <i>Papaver bivalve</i> subsp. <i>hybridum</i> .
	98	Arch	LC for the period 1930-1999 but a 44% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	81	Arch	
	78	Arch	The sole archaeophyte subspecies in England is <i>Papaver somniferum</i> subsp. <i>somniferum</i> .
	96		
	79		
	85		
	85		
	85		LC for the period 1930-1999 but a 33% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	95		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Pastinaca sativa</i> subsp. <i>sylvestris</i>	LC								
WL	<i>Pastinaca sativa</i> subsp. <i>urens</i>	WL								
LC	<i>Pedicularis palustris</i>	VU	A2c AOO and EOO trend	41	37					
LC	<i>Pedicularis sylvatica</i>	VU	A2c AOO and EOO trend	39	30					
LC	<i>Pedicularis sylvatica</i> subsp. <i>hibernica</i>	DD								
LC	<i>Pedicularis sylvatica</i> subsp. <i>sylvatica</i>	VU	A2c AOO and EOO trend	39	30					
LC	<i>Persicaria amphibia</i>	LC								
LC	<i>Persicaria bistorta</i>	LC								
LC	<i>Persicaria hydropiper</i>	LC								
LC	<i>Persicaria lapathifolia</i>	LC								
LC	<i>Persicaria maculosa</i>	LC								
VU	<i>Persicaria minor</i>	LC								
VU	<i>Persicaria mitis</i>	VU	A2c AOO trend	35						
LC	<i>Persicaria vivipara</i>	LC								
LC	<i>Petasites hybridus</i>	LC								
VU	<i>Petrorhagia nanteuillii</i>	VU	D2			2	100s - 1000s	N2		
EN	<i>Petrorhagia prolifera</i>	EN	D			1	c.250			
LC	<i>Petroselinum crispum</i>	LC								
LC	<i>Petroselinum segetum</i>	LC					N2			
LC	<i>Peucedanum officinale</i>	LC								
LC	<i>Phalaris arundinacea</i>	LC								
LC	<i>Phegopteris connectilis</i>	LC								
LC	<i>Phleum alpinum</i>	CR	D			1	<50			
LC	<i>Phleum arenarium</i>	NT	A2c AOO trend	27						
LC	<i>Phleum bertolonii</i>	LC								
LC	<i>Phleum phleoides</i>	LC								
LC	<i>Phleum pratense</i>	LC								
LC	<i>Phleum pratense</i> s.l.	LC								
LC	<i>Phragmites australis</i>	LC								
LC	<i>Physospermum cornubiense</i>	LC								
LC	<i>Phyteuma orbiculare</i>	LC								
EN	<i>Phyteuma spicatum</i>	EN	A2ac AOO trend; C2a(i)			8	c.200			
LC	<i>Pilosella officinarum</i>	LC								

International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
			Assumed LC as species.
			Insufficient mapping data. Possibly native and overlooked (Stace 2010).
			Assumed VU as species.
	78		
	94		
	9		
	100		The population in 2013 numbered many thousands, but numbers fluctuate between years and have been in the low hundreds in recent years.
	100		Native or alien. Numbers fluctuate between recording periods and in the past 10 years have been as high as 'hundreds' and as low as 40 (+ seedlings). A precautionary estimate of <250 individuals has been used for the assessment.
	85	Arch	LC for the period 1930-1999 but a 53% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
possibly	97		
	100		
			LC for the period 1930-1999 but a 31% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	6		Vegetative plants are easily overlooked, but survey results from the past 30 years suggest a population of <50 plants.
	76		
	100		LC for the period 1930-1999 but a 58% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		LC for the period 1930-1999 but a 42% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		
	100		Population and location data is from Rumsey <i>et al.</i> 2011.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
NT	<i>Pilosella peleteriana</i>	LC								
WL	<i>Pilosella peleteriana</i> subsp. <i>peleteriana</i>	WL								
WL	<i>Pilosella peleteriana</i> subsp. <i>subpeleteriana</i>	WL								
WL	<i>Pilosella peleteriana</i> subsp. <i>tenuiscapa</i>	WL								
NT	<i>Pilularia globulifera</i>	VU	A2c EOO trend	42						
LC	<i>Pimpinella major</i>	LC								
LC	<i>Pimpinella saxifraga</i>	LC								
LC	<i>Pinguicula lusitanica</i>	LC								
LC	<i>Pinguicula vulgaris</i>	VU	A2c AOO trend	39						
LC	<i>Pinus sylvestris</i>	WL								
LC	<i>Plantago coronopus</i>	LC								
LC	<i>Plantago lanceolata</i>	LC								
LC	<i>Plantago major</i>	LC								
LC	<i>Plantago major</i> subsp. <i>intermedia</i>	LC								
LC	<i>Plantago major</i> subsp. <i>major</i>	LC								
LC	<i>Plantago maritima</i>	LC								
LC	<i>Plantago media</i>	NT	A2c AOO trend	22						
VU	<i>Platanthera bifolia</i>	EN	A2c AOO and EOO trend	54	52					
NT	<i>Platanthera chlorantha</i>	LC								
LC	<i>Poa alpina</i>	VU	D2			5	100s?			
LC	<i>Poa angustifolia</i>	LC								
LC	<i>Poa annua</i>	LC								
LC	<i>Poa bulbosa</i>	LC								
LC	<i>Poa compressa</i>	LC								
VU	<i>Poa glauca</i>	VU	D2			5	100s?			
LC	<i>Poa humilis</i>	LC								
LC	<i>Poa infirma</i>	LC						N2		
LC	<i>Poa nemoralis</i>	LC								
LC	<i>Poa pratensis</i> s.l.	LC								
LC	<i>Poa pratensis</i> s.s..	LC								
LC	<i>Poa trivialis</i>	LC								
LC	<i>Polemonium caeruleum</i>	LC								
LC	<i>Polycarpon tetraphyllum</i>	LC						N2		
EN	<i>Polygala amarella</i>	EN	A2c AOO trend	>50		15	c.950			
LC	<i>Polygala calcarea</i>	LC						N2		
LC	<i>Polygala serpyllifolia</i>	NT	A2c AOO trend	22						

International responsibility?	Proportion (%) of GB hectads in England	Native_archaeophyte	Comments
	88		Insufficient mapping data.
			Insufficient mapping data.
			Insufficient mapping data.
	100		
			A widely planted neophyte across England, but may be an archaeophyte or part of a remnant native population at two Northumberland locations (Swan 1993; Manning <i>et al.</i> 2010).
			Assumed LC as species.
			Assumed LC as species.
	95		
			LC for the period 1930-1999 but a 33% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	6		It is difficult to estimate numbers but they are likely to number in the low hundreds. Locations are within gullies or on ledges and so are susceptible to land slip.
	91		
	97		
	87		
	5		Like <i>Poa alpina</i> , it is difficult to estimate numbers but they are likely to number in the low hundreds. Locations are within gullies or on ledges and so are susceptible to land slip.
	100		
	100		LC for the period 1930-1999 but a 31% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		
	100		<i>P. amarella</i> subsp. <i>amarella</i> and <i>P. amarella</i> subsp. <i>austriaca</i> are not included as separate taxa in this List, but a separate threat assessment of VU and CR respectively has been calculated, pending a decision on whether to include them as separate taxa on the Main List.
	100		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Polygala vulgaris</i>	LC								
DD	<i>Polygala vulgaris</i> subsp. <i>collina</i>	DD								
LC	<i>Polygala vulgaris</i> subsp. <i>vulgaris</i>	LC								
LC	<i>Polygonatum multiflorum</i>	LC								
LC	<i>Polygonatum odoratum</i>	LC								
VU	<i>Polygonatum verticillatum</i>	RE								
LC	<i>Polygonum arenastrum</i>	LC								
LC	<i>Polygonum aviculare</i>	LC								
LC	<i>Polygonum aviculare</i> agg.	LC								
VU	<i>Polygonum maritimum</i>	VU	D1			<1000				
LC	<i>Polygonum oxyspermum</i>	LC								
LC	<i>Polygonum rurivagum</i>	LC								
LC	<i>Polypodium cambricum</i>	LC								
LC	<i>Polypodium interjectum</i>	LC								
LC	<i>Polypodium vulgare</i>	LC								
LC	<i>Polypodium vulgare</i> s.l.	LC								
LC	<i>Polypogon monspeliensis</i>	LC					N2			
LC	<i>Polystichum aculeatum</i>	LC								
VU	<i>Polystichum lonchitis</i>	EN	D			14?	c.250			
LC	<i>Polystichum setiferum</i>	LC								
LC	<i>Populus nigra</i>	LC								
LC	<i>Populus tremula</i>	LC								
CR	<i>Potamogeton acutifolius</i>	EN	C2a(i)			<2500				
LC	<i>Potamogeton alpinus</i>	VU	A2c AOO and EOO trend	47	42					
LC	<i>Potamogeton berchtoldii</i>	LC								
LC	<i>Potamogeton coloratus</i>	LC								
EN	<i>Potamogeton compressus</i>	EN	A2c AOO trend	57						
LC	<i>Potamogeton crispus</i>	LC								
LC	<i>Potamogeton filiformis</i>	RE								
NT	<i>Potamogeton friesii</i>	VU	A2c AOO trend	48						
LC	<i>Potamogeton gramineus</i>	NT	A2c AOO trend	27						
LC	<i>Potamogeton lucens</i>	LC								
LC	<i>Potamogeton natans</i>	LC								
VU	<i>Potamogeton nodosus</i>	VU	D2			5				
LC	<i>Potamogeton obtusifolius</i>	LC								
LC	<i>Potamogeton pectinatus</i>	LC								

International responsibility?
 Proportion (%) of GB hectads in England
 Native_archaeophyte

Comments

				Assumed LC as species.
	95			LC for the period 1930-1999 but a 35% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	97			LC for the period 1930-1999 but a 50% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100			
	100			
	7			Recent population data from the DDb and RPRs suggest a population not in excess of 250 mature individuals. However, a repeat survey of all locations is desirable so that an accurate count can be determined.
	90			The sole native subspecies in England is <i>Populus nigra</i> subsp. <i>betulifolia</i> .
	100			
	87			LC for the period 1930-1999 but a 47% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	76			
				Not seen since 1992 at its sole England locality. See Section 6.4.
				A confidence level of 85% was accepted for the AOO trend.
	92			LC for the period 1930-1999 but a 37% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100			
				LC for the period 1930-1999 but a 48% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	81			

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Potamogeton perfoliatus</i>	LC								
LC	<i>Potamogeton polygonifolius</i>	LC								
NT	<i>Potamogeton praelongus</i>	EN	A2c AOO trend	69						
LC	<i>Potamogeton pusillus</i>	LC								
LC	<i>Potamogeton trichoides</i>	LC								
LC	<i>Potentilla anglica</i>	LC								
LC	<i>Potentilla anserina</i>	LC								
NT	<i>Potentilla argentea</i>	NT	A2C AOO trend	26						
LC	<i>Potentilla crantzii</i>	LC								
LC	<i>Potentilla erecta</i>	NT	A2C AOO trend	26						
LC	<i>Potentilla erecta</i> subsp. <i>erecta</i>	NT	A2C AOO trend							
LC	<i>Potentilla erecta</i> subsp. <i>strictissima</i>	DD								
NT	<i>Potentilla fruticosa</i>	NT	B; D		<25	<10000				
LC	<i>Potentilla reptans</i>	LC								
LC	<i>Potentilla sterilis</i>	LC								
LC	<i>Potentilla tabernaemontani</i> (<i>Potentilla neumanniana</i>)	LC								
LC	<i>Poterium sanguisorba</i> (<i>Sanguisorba minor</i>)	LC								
NT	<i>Primula elatior</i>	LC								
VU	<i>Primula farinosa</i>	NT	A2c AOO trend	23						
LC	<i>Primula veris</i>	LC								
LC	<i>Primula vulgaris</i>	LC								
LC	<i>Prunella vulgaris</i>	LC								
LC	<i>Prunus avium</i>	LC								
LC	<i>Prunus cerasus</i>	NT	A2c AOO trend	29						
LC	<i>Prunus domestica</i>	LC								
LC	<i>Prunus domestica</i> subsp. <i>domestica</i>	LC								
LC	<i>Prunus domestica</i> subsp. <i>insititia</i>	LC								
LC	<i>Prunus domestica</i> subsp. <i>italica</i>	LC								
LC	<i>Prunus padus</i>	LC								
LC	<i>Prunus spinosa</i>	LC								
VU	<i>Pseudorchis albida</i>	VU	C2a(i); D1			<1000				
LC	<i>Pteridium aquilinum</i>	LC								
LC	<i>Puccinellia distans</i>	LC								
VU	<i>Puccinellia fasciculata</i>	NT	A2c AOO trend	23						
LC	<i>Puccinellia maritima</i>	LC								

International responsibility?	Proportion (%) of GB hectads in England	Native_archaeophyte	Comments
			LC for the period 1930-1999 but a 36% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	90		LC for the period 1930-1999 but a 35% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7. LC for the period 1930-1999 but a 31% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	94		
			Assume NT as species.
	100		A decline in population has been recorded in recent years in the River Tees subpopulations (S. Hedley pers. comm.), and repeat surveys at native locations are required to assess the current status of this species in England.
	90		LC for the period 1930-1999 but a 34% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7. The sole native subspecies in England is <i>Poterium sanguisorba</i> subsp. <i>sanguisorba</i> .
	100		
	100		Formerly present in Scotland (VC78), but now only extant in England.
	81		
	76	Arch	
	79	Arch	
		Arch	Assumed LC as species.
		Arch	Assumed LC as species.
		Arch	Assumed LC as species.
	10		
	100		The sole native subspecies in England is <i>Puccinellia distans</i> subsp. <i>distans</i> . A confidence level of 85% was accepted for the AOO trend.
	94		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Puccinellia rupestris</i>	LC								
LC	<i>Pulicaria dysenterica</i>	LC								
CR	<i>Pulicaria vulgaris</i>	EN	A2ac AOO and EOO trend	51	53	>50000				
LC	<i>Pulmonaria longifolia</i>	LC					N2			
EN	<i>Pulmonaria obscura</i>	VU	D1; D2			3	c.600			
VU	<i>Pulsatilla vulgaris</i>	VU	A2c AOO trend	34						
VU	<i>Pyrola media</i>	EN	D			11?	<250			
LC	<i>Pyrola minor</i>	NT	A2c AOO trend	25						
LC	<i>Pyrola rotundifolia</i>	LC								
LC	<i>Pyrola rotundifolia</i> subsp. <i>maritima</i>	LC								
NT	<i>Pyrola rotundifolia</i> subsp. <i>rotundifolia</i>	VU	A2c AOO trend	>30						
LC	<i>Pyrus communis</i> s.l.	LC								
VU	<i>Pyrus cordata</i>	EN	D				40-60	N2		
LC	<i>Quercus petraea</i>	LC								
LC	<i>Quercus robur</i>	LC								
NT	<i>Radiola linoides</i>	VU	A2c AOO trend	41						
LC	<i>Ranunculus acris</i>	LC								
LC	<i>Ranunculus aquatilis</i>	LC								
CR	<i>Ranunculus arvensis</i>	EN	A2c AOO and EOO trend	77	69					
LC	<i>Ranunculus auricomus</i>	LC								
LC	<i>Ranunculus baudotii</i>	LC								
LC	<i>Ranunculus bulbosus</i>	LC								
LC	<i>Ranunculus circinatus</i>	LC								
LC	<i>Ranunculus flammula</i>	VU	A2c AOO trend	32						
LC	<i>Ranunculus fluitans</i>	LC								
LC	<i>Ranunculus hederaceus</i>	LC								
LC	<i>Ranunculus lingua</i>	LC								
LC	<i>Ranunculus omiophyllus</i>	LC								
VU	<i>Ranunculus ophioglossifolius</i>	CR	D			2	<50			
LC	<i>Ranunculus parviflorus</i>	LC						N2		
LC	<i>Ranunculus peltatus</i>	LC								
LC	<i>Ranunculus penicillatus</i>	LC								
LC	<i>Ranunculus penicillatus</i> subsp. <i>penicillatus</i>	LC								

	International responsibility?	Proportion (%) of GB hectads in England	Native_archaeophyte	Comments
possibly				LC for the period 1930-1999 but a 45% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
		87		
		100		The threat status is based on AOO and EOO trends and also Steven & Thomas (2013).
possibly		100		LC for the period 1930-1999 but a 38% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
		100		
		100		A confidence level of 85% was accepted for the AOO trend.
		7		Threat is based on the most recent estimate of mature individuals for all locations using information from the DDb and relevant RPRs.
				LC for the period 1930-1999 but a 44% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7. Assume LC as species.
		90	Arch	
		100		The threat status (and population estimate) is based on the number of mature individuals, with groups of suckers counted as one individual. This deviates from the GB method for estimating population size which attempted to include each suckering stem as an individual.
		78		
		94	Arch	
		83		
		92		LC for the period 1930-1999 but a 45% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7. The sole native subspecies in England is <i>Ranunculus flammula</i> subsp. <i>flammula</i> .
		84		
		77		
		100		Very low numbers in 2013, seed bank longevity believed to be transient, and suitable habitat becoming dominated by <i>Phalaris arundinacea</i> (R. Lansdown pers. comm.). Urgent action is required for this England-only species.
		90		LC for the period 1930-1999 but a 41% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
				LC for the period 1930-1999 but a 39% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
		81		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Ranunculus penicillatus</i> subsp. <i>pseudofluitans</i>	LC								
LC	<i>Ranunculus repens</i>	LC								
VU	<i>Ranunculus reptans</i>	CR	D			1	<50			
LC	<i>Ranunculus sardous</i>	LC								
LC	<i>Ranunculus sceleratus</i>	LC								
LC	<i>Ranunculus trichophyllus</i>	LC								
EN	<i>Ranunculus tripartitus</i>	EN	A2c AOO and EOO trend	57	79					
LC	<i>Raphanus raphanistrum</i>	LC								
LC	<i>Raphanus raphanistrum</i> subsp. <i>maritimus</i>	LC								
LC	<i>Raphanus raphanistrum</i> subsp. <i>raphanistrum</i>	LC								
LC	<i>Reseda lutea</i>	LC								
LC	<i>Reseda luteola</i>	LC								
LC	<i>Rhamnus cathartica</i>	LC								
LC	<i>Rhinanthus angustifolius</i>	LC								
LC	<i>Rhinanthus minor</i>	LC								
DD	<i>Rhinanthus minor</i> subsp. <i>calcareus</i>	DD								
WL	<i>Rhinanthus minor</i> subsp. <i>minor</i>	WL								
DD	<i>Rhinanthus minor</i> subsp. <i>monticola</i>	DD								
WL	<i>Rhinanthus minor</i> subsp. <i>stenophyllus</i>	WL								
LC	<i>Rhynchospora alba</i>	NT	A2c AOO and EOO trend	29	27					
LC	<i>Rhynchospora fusca</i>	LC								
LC	<i>Ribes alpinum</i>	LC								
LC	<i>Ribes rubrum</i>	LC								
LC	<i>Ribes spicatum</i>	LC								
VU	<i>Romulea columnae</i>	VU	D2			2	>3000	N2		
LC	<i>Rorippa amphibia</i>	LC								
LC	<i>Rorippa palustris</i>	LC								
LC	<i>Rorippa sylvestris</i>	LC								
NT	<i>Rosa agrestis</i>	NT	D				<10000			
LC	<i>Rosa arvensis</i>	LC								
LC	<i>Rosa caesia</i>	LC								
LC	<i>Rosa caesia</i> subsp. <i>caesia</i>	LC								
LC	<i>Rosa caesia</i> subsp. <i>vosagiaca</i>	LC								
LC	<i>Rosa canina</i> s.s.	LC								
LC	<i>Rosa micrantha</i>	LC								
LC	<i>Rosa mollis</i>	LC								

International responsibility?
 Proportion (%) of GB hecctads in England
 Native_archaeophyte

Comments

				Tourist pressures and very small extent of population make this sole location distinctly vulnerable with a plausible threat.
	92			Native or alien. LC for the period 1930-1999 but a 33% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	81			
	77			
			Arch	
	89			Native or alien.
	81		Arch	
	96			
	82		Arch	
yes	100			Insufficient mapping data. The taxon may be endemic to GB, but equally it may have been overlooked in northern Europe. Insufficient mapping data.
				Insufficient mapping data.
				Insufficient mapping data.
	100			LC for the period 1930-1999 but a 37% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
				Native or alien.
	100			The population estimate is from 2011.
	99			
	77			
	79			
	89			
	85			
	85			

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Rosa obtusifolia</i>	LC								
LC	<i>Rosa rubiginosa</i>	LC								
LC	<i>Rosa sherardii</i>	LC								
LC	<i>Rosa spinosissima</i> (<i>Rosa pimpinellifolia</i>)	LC								
LC	<i>Rosa stylosa</i>	LC								
LC	<i>Rosa tomentosa</i>	LC								
LC	<i>Rubia peregrina</i>	LC								
LC	<i>Rubus caesius</i>	LC								
LC	<i>Rubus chamaemorus</i>	LC								
LC	<i>Rubus fruticosus</i> agg.	LC								
LC	<i>Rubus idaeus</i>	LC								
LC	<i>Rubus saxatilis</i>	LC								
LC	<i>Rumex acetosa</i>	LC								
LC	<i>Rumex acetosa</i> subsp. <i>acetosa</i>	LC								
WL	<i>Rumex acetosa</i> subsp. <i>biformis</i>	WL								
LC	<i>Rumex acetosa</i> subsp. <i>hibernicus</i>	DD								
LC	<i>Rumex acetosella</i>	LC								
LC	<i>Rumex acetosella</i> subsp. <i>acetosella</i>	LC								
LC	<i>Rumex acetosella</i> subsp. <i>pyrenaicus</i>	LC								
LC	<i>Rumex conglomeratus</i>	LC								
LC	<i>Rumex crispus</i>	LC								
LC	<i>Rumex crispus</i> subsp. <i>crispus</i>	LC								
LC	<i>Rumex crispus</i> subsp. <i>littoreus</i>	LC								
LC	<i>Rumex crispus</i> subsp. <i>uliginosus</i>	LC								
LC	<i>Rumex hydrolapathum</i>	LC								
LC	<i>Rumex longifolius</i>	LC								
LC	<i>Rumex maritimus</i>	LC								
LC	<i>Rumex obtusifolius</i>	LC								
LC	<i>Rumex palustris</i>	LC								
LC	<i>Rumex pulcher</i>	LC					N2			
EN	<i>Rumex rupestris</i>	VU	D1			c.700				
LC	<i>Rumex sanguineus</i>	LC								
NT	<i>Ruppia cirrhosa</i>	LC								
LC	<i>Ruppia maritima</i>	NT	A2c AOO trend	25						
LC	<i>Ruscus aculeatus</i>	LC					N2			

International responsibility?	Proportion (%) of GB hectads in England	Native_archaeophyte	Comments
	94		
	94		
	89		
	76		
	88		
			LC for the period 1930-1999 but a 43% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			Assumed LC as species.
			Insufficient mapping data.
			Insufficient mapping data.
			Assumed LC as species.
			Assumed LC as species.
	82		
			Assumed LC as species.
	89		
	97		LC for the period 1930-1999 but a 32% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	98		LC for the period 1930-1999 but a 33% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	99		The sole native subspecies in England is <i>Rumex pulcher</i> subsp. <i>pulcher</i> .
yes	87		
	78		LC for the period 1930-1999 but a 48% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	99		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Sagina apetala</i> (<i>Sagina apetala</i> subsp. <i>apetala</i>)	LC								
LC	<i>Sagina apetala</i> s.l.	LC								
LC	<i>Sagina filicaulis</i> (<i>Sagina apetala</i> subsp. <i>erecta</i>)	LC								
LC	<i>Sagina maritima</i>	LC								
LC	<i>Sagina nodosa</i>	VU	A2c AOO and EOO trend	36	39					
LC	<i>Sagina procumbens</i>	LC								
LC	<i>Sagina subulata</i>	NT	A2c AOO trend	21						
LC	<i>Sagittaria sagittifolia</i>	LC								
LC	<i>Salicornia dolichostachya</i>	LC								
DD	<i>Salicornia emerici</i> (<i>Salicornia nitens</i>)	DD								
LC	<i>Salicornia europaea</i>	LC								
LC	<i>Salicornia fragilis</i>	LC								
DD	<i>Salicornia obscura</i>	DD								
LC	<i>Salicornia pusilla</i>	LC								
LC	<i>Salicornia ramosissima</i>	LC								
LC	<i>Salix alba</i>	LC								
LC	<i>Salix aurita</i>	LC								
LC	<i>Salix caprea</i>	LC								
LC	<i>Salix caprea</i> subsp. <i>caprea</i>	LC								
LC	<i>Salix caprea</i> subsp. <i>sphaelata</i>	LC								
LC	<i>Salix cinerea</i>	LC								
LC	<i>Salix cinerea</i> subsp. <i>cinerea</i>	LC								
LC	<i>Salix cinerea</i> subsp. <i>oleifolia</i>	LC								
LC	<i>Salix fragilis</i>	LC								
LC	<i>Salix herbacea</i>	LC								
VU	<i>Salix lapponum</i>	CR	D			2	<50			
LC	<i>Salix myrsinifolia</i>	LC								
LC	<i>Salix pentandra</i>	LC								
LC	<i>Salix phylicifolia</i>	LC					S2			
LC	<i>Salix purpurea</i>	LC								
LC	<i>Salix repens</i>	NT	A2c AOO trend	20						
LC	<i>Salix triandra</i>	LC								
LC	<i>Salix viminalis</i>	LC								
VU	<i>Salsola kali</i>	LC								

International responsibility?	Proportion (%) of GB hectads in England	Native_archaeophyte	Comments
	99		
	88		
	80		LC for the period 1930-1999 but a 33% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		
yes	78		LC for the period 1930-1999 but a 37% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	78	Arch	
			Assumed LC as species. Assumed LC as species.
			Assumed LC as species. Assumed LC as species.
		Arch	
	4		LC for the period 1930-1999 but a 34% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	1		One of the two native locations has been augmented with plantings. There is also a third location supporting an introduction of 25 plantings, but this is not included in the threat assessment for the reasons outlined in Section 4.5.
			LC for the period 1930-1999 but a 54% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			LC for the period 1930-1999 but a 35% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	89	Arch	
		Arch	
			The sole native subspecies in England is <i>Salsola kali</i> subsp. <i>kali</i> . It is LC for the period 1930-1999, but a 39% decline detected when assessing 1987+ data as a proportion of all records, including pre-1930 data. See Section 6.7.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
NT	<i>Salvia pratensis</i>	NT	A2c AOO and EOO trend	21	21					
LC	<i>Salvia verbenaca</i>	NT	A2c AOO trend	21						
LC	<i>Sambucus ebulus</i>	LC								
LC	<i>Sambucus nigra</i>	LC								
LC	<i>Samolus valerandi</i>	LC								
LC	<i>Sanguisorba officinalis</i>	LC								
LC	<i>Sanicula europaea</i>	NT	A2c AOO trend	27						
LC	<i>Saponaria officinalis</i>	LC								
LC	<i>Sarcocornia perennis</i>	LC								
LC	<i>Saussurea alpina</i>	VU	D1			9?	<1000			
LC	<i>Saxifraga aizoides</i>	LC								
LC	<i>Saxifraga granulata</i>	LC								
VU	<i>Saxifraga hirculus</i>	LC				13	450000			
VU	<i>Saxifraga hypnoides</i>	LC						S2		
LC	<i>Saxifraga nivalis</i>	CR	D			3	<50			
LC	<i>Saxifraga oppositifolia</i>	LC								
LC	<i>Saxifraga stellaris</i>	LC								
LC	<i>Saxifraga tridactylites</i>	LC								
LC	<i>Scabiosa columbaria</i>	LC								
CR	<i>Scandix pecten-veneris</i>	EN	A2c AOO and EOO trend	78	76					
LC	<i>Schedonorus arundinaceus</i> (<i>Festuca arundinacea</i>)	LC								
LC	<i>Schedonorus giganteus</i> (<i>Festuca gigantea</i>)	LC								
LC	<i>Schedonorus pratensis</i> (<i>Festuca pratensis</i>)	LC								
LC	<i>Scheuchzeria palustris</i>	RE								
LC	<i>Schoenoplectus lacustris</i>	LC								
LC	<i>Schoenoplectus tabernaemontani</i>	LC								
CR	<i>Schoenoplectus triquetus</i>	CR	C2a(i); D			1	6			
LC	<i>Schoenus nigricans</i>	LC								
LC	<i>Scilla autumnalis</i>	LC								
LC	<i>Scilla verna</i>	LC								
EN	<i>Scirpoides holoschoenus</i>	VU	D2			2				
LC	<i>Scirpus sylvaticus</i>	LC								
EN	<i>Scleranthus annuus</i>	EN	A2c AOO and EOO trend	67	64					

International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
	95		Native or alien.
	95	Arch	LC for the period 1930-1999 but a 49% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	85		
	79	Arch	
	97		
	2		There is evidence of decline (c.20% of locations?) in the Central Lakes, but the assessment is based on the population estimate as this gives the greater threat status.
	8		
			See Section 7.
	4		In England, this species is only present in Cumbria. All locations are small and vulnerable to disturbance (Porter & Halliday in press).
	2		
	82		
	93		
	97	Arch	
			All English locations were lost before 1900 due to drainage and eutrophication (Rumsey 2002b).
	100		On the brink of extinction, with all native plants lost and only introduced plants surviving. Introductions are included in the threat assessment for the reasons outlined in Section 4.5. An estimate of population size is problematic, and so for the purposes of this Red List one subpopulation equates to one 'mature individual'. The genome of this species survives in hybrids with <i>S. tabernaemontani</i> and possibly <i>S. lacustris</i> at a number of locations in S. E. England. LC for the period 1930-1999 but a 44% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		LC for the period 1930-1999 but a 32% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	possibly 100		
	75		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
EN	<i>Scleranthus annuus</i> subsp. <i>annuus</i>	EN								
DD	<i>Scleranthus annuus</i> subsp. <i>polycarpus</i>	DD								
EN	<i>Scleranthus perennis</i> subsp. <i>prostratus</i>	EN	A2ac AOO trend					yes		
VU	<i>Scorzonera humilis</i>	VU	D2			1	>60000			
LC	<i>Scorzoneroideis autumnalis</i> (<i>Leontodon autumnalis</i>)	LC								
LC	<i>Scrophularia auriculata</i>	LC								
LC	<i>Scrophularia nodosa</i>	LC								
LC	<i>Scrophularia umbrosa</i>	LC								
LC	<i>Scutellaria galericulata</i>	LC								
LC	<i>Scutellaria minor</i>	LC								
LC	<i>Sedum acre</i>	LC								
LC	<i>Sedum album</i>	LC								
LC	<i>Sedum anglicum</i>	LC								
LC	<i>Sedum forsterianum</i>	LC								
LC	<i>Sedum rosea</i>	LC								
LC	<i>Sedum telephium</i>	LC								
NT	<i>Sedum villosum</i>	VU	A2c EOO trend		50					
LC	<i>Selaginella selaginoides</i>	LC								
VU	<i>Selinum carvifolia</i>	EN	B1ab(i-v) +2ab(i-v)		2?		10500			
LC	<i>Senecio aquaticus</i>	NT	A2c AOO trend	24						
EW	<i>Senecio eboracensis</i>	EW						yes		
LC	<i>Senecio erucifolius</i>	LC								
LC	<i>Senecio jacobaea</i>	LC								
CR	<i>Senecio paludosus</i>	CR	D			2	27			
LC	<i>Senecio sylvaticus</i>	LC								
LC	<i>Senecio vulgaris</i>	LC								
LC	<i>Senecio vulgaris</i> subsp. <i>vulgaris</i>	LC								
WL	<i>Senecio vulgaris</i> subsp. <i>denticulatus</i>	WL								
WL	<i>Serapias parviflora</i>	WL				1	0	N2		
LC	<i>Serratula tinctoria</i>	LC								
NT	<i>Seseli libanotis</i>	NT	B; D		<30		<10000			
LC	<i>Sesleria caerulea</i>	LC								
LC	<i>Sherardia arvensis</i>	LC								

International responsibility?
 Proportion (%) of GB hecctads in England
 Native_archaeophyte

Comments

Assume EN as species.

International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
yes	100		The sole native subspecies in England is <i>Scleranthus perennis</i> subsp. <i>prostratus</i> . Lost from two sites in the past 10 years. Only one extant location (Lakenheath) has not been bolstered by seeding (Y. Leonard pers. comm.).
	89		
	78	Arch	
	4		The EOO decline of 50% just meets the EN threat category. However, it is likely to still be present in many upland areas with no post-1987 record (Croft 2002) and so the threat status has been downgraded to VU.
	100		<i>S. carvifolia</i> has been reported as lost from one of the three known locations in the Fens of Cambridgeshire (J. Cadbury pers. comm.). c.99% of the GB population is now located at one location. A recent experimental introduction on restored farmland in 2009 is not included in the assessment for the reasons outlined in Section 4.5.
yes			Introductions of this EW taxon have taken place in York in 2014.
	92		
	100		The long established (>20 years) introduction at Woodwalton Fen NNR was included in the assessment. This introduction holds c.95% of the GB population.
			Assumed LC as species.
			Insufficient mapping data and more taxonomic work required.
	100		Possible natural colonist first recorded in 1994. Recent accounts from N. W. France suggest that the putative native range may be expanding, and long-distance seed dispersal is plausible. The location was augmented in 1998, and no plants have been recorded since 2008.
	76		
	100		
	95		
	82		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Sibthorpia europaea</i>	LC								
LC	<i>Silaum silaus</i>	LC								
LC	<i>Silene acaulis</i>	VU	D1			9	250			
VU	<i>Silene conica</i>	EN	A2c AOO trend	51						
LC	<i>Silene dioica</i>	LC								
LC	<i>Silene flos-cuculi</i> (<i>Lychnis flos-cuculi</i>)	NT	A2c AOO trend	25						
EN	<i>Silene gallica</i>	EN	A2c AOO trend	79						
LC	<i>Silene latifolia</i>	LC								
VU	<i>Silene noctiflora</i>	VU	A2c AOO and EOO trend	57	52					
NT	<i>Silene nutans</i>	NT	A2c EOO trend		26					
EN	<i>Silene otites</i>	EN	A2c AOO trend	58						
VU	<i>Silene suecica</i> (<i>Lychnis alpina</i>)	CR	D			1	50			
LC	<i>Silene uniflora</i>	LC								
LC	<i>Silene vulgaris</i>	LC								
LC	<i>Silybum marianum</i>	LC								
LC	<i>Sinapis alba</i>	LC								
LC	<i>Sinapis arvensis</i>	LC								
LC	<i>Sison amomum</i>	LC						N2		
LC	<i>Sisymbrium officinale</i>	LC								
EN	<i>Sium latifolium</i>	EN	A2c AOO and EOO trend	60	77					
LC	<i>Smyrniolum olusatrum</i>	LC								
LC	<i>Solanum dulcamara</i>	LC								
LC	<i>Solanum nigrum</i>	LC								
LC	<i>Solidago virgaurea</i>	NT	A2c AOO trend	24						
LC	<i>Sonchus arvensis</i>	LC								
LC	<i>Sonchus asper</i>	LC								
LC	<i>Sonchus oleraceus</i>	LC								
LC	<i>Sonchus palustris</i>	LC								
EN	<i>Sorbus admonitor</i>	EN	D				110	yes		
NT	<i>Sorbus anglica</i>	VU	D1				<1000			
LC	<i>Sorbus aria</i>	LC						N2		
LC	<i>Sorbus aucuparia</i>	LC								
VU	<i>Sorbus bristolensis</i>	VU	D1; D2			1	291	yes		
CR	<i>Sorbus cheddarensis</i>	CR	D				48	yes		
LC	<i>Sorbus devoniensis</i>	LC								
CR	<i>Sorbus domestica</i>	CR	D			3	<30	N2		
VU	<i>Sorbus eminens</i>	VU	D1				~400		yes	
EN	<i>Sorbus eminentiformis</i>	EN	D				<100		yes	

	International responsibility?	Proportion (%) of GB hectads in England	Native_archaeophyte	Comments
	possibly	84		
		95		
		1		
		91		
		75	Arch	The historical decline of <i>S. gallica</i> is very close to the CR threshold for AOO. However, many of the extant subpopulations are now considered to be stable and a few hold many hundreds of individuals, into the low thousands.
		97	Arch	AOO and EOO trends would indicate EN, but since 1999 the taxon has shown signs of recovery due to agri-environment schemes and so is cautiously assessed as VU for this Red List.
		100		
		81		
		89	Arch	
			Arch	The sole archaeophyte subspecies in England is <i>Sinapis alba</i> subsp. <i>alba</i> .
			Arch	
		96		
			Arch	
		100		
		81	Arch	
		75		
		90		Native or alien.
		100		
	yes	100		A long-known but only recently described species (Rich & Proctor 2009), restricted to the East Lyn Valley in Devon. The total GB population is estimated at >1000 trees, but <40% of locations are within England, and it is probable that the population in England is closer to 500 individuals.
		98		
	yes	100		The population estimate is based on field data collected in 2013 (L. Houston pers.comm.).
	yes	100		Endemic to Cheddar Gorge, Somerset. The estimate includes seven currently unconfirmed mature individuals (L. Houston pers.comm.).
		100		
		80		
	yes	88		The GB population is estimated at 400-500 individuals (Rich <i>et al.</i> 2010b).
	yes			

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
CR	<i>Sorbus eminentoides</i>	CR	D			28		yes		
	<i>Sorbus evansii</i>	EN	D			70		yes		
	<i>Sorbus greenii</i>	EN	D			>59		yes		
	<i>Sorbus herefordensis</i>	EN	D			118		yes		
NT	<i>Sorbus lancastricensis</i>	NT	D			2000		yes		
EN	<i>Sorbus leighensis</i>	EN	D			105		yes		
EN	<i>Sorbus margaretae</i>	EN	D			c.120		yes		
CR	<i>Sorbus parviloba</i>	CR	D			8		yes		
LC	<i>Sorbus porrigentifformis</i>	LC							yes	
	<i>Sorbus richii</i>	EN	D			>41		yes		
LC	<i>Sorbus rupicola</i>	LC					S2			
CR	<i>Sorbus rupicoloides</i>	CR	D			16		yes		
CR	<i>Sorbus saxicola</i>	CR	D			17			yes	
	<i>Sorbus spectans</i>	EN	D			>60		yes		
VU	<i>Sorbus subcuneata</i>	VU	D1		c.9	300		yes		
LC	<i>Sorbus torminalis</i>	LC								
EN	<i>Sorbus vexans</i>	EN	D			>70		yes		
EN	<i>Sorbus whiteana</i>	EN	D			c.76			yes	
EN	<i>Sorbus wilmottiana</i>	EN	D		1	97		yes		
LC	<i>Sparganium angustifolium</i>	LC								
LC	<i>Sparganium emersum</i>	LC								
LC	<i>Sparganium erectum</i>	LC								
LC	<i>Sparganium natans</i>	VU	A2c AOO and EOO trend	38	35					
LC	<i>Spartina anglica</i>	LC								
EN	<i>Spartina maritima</i>	EN	A2c EOO trend		57		N2			
VU	<i>Spergula arvensis</i>	VU	A2c AOO trend	46						
LC	<i>Spergularia marina</i>	LC								
LC	<i>Spergularia media</i>	LC								
LC	<i>Spergularia rubra</i>	LC								
LC	<i>Spergularia rupicola</i>	LC								
EX	<i>Spiranthes aestivalis</i>	EX								
LC	<i>Spiranthes romanzoffiana</i>	RE								
NT	<i>Spiranthes spiralis</i>	NT	A2c AOO trend	27						
LC	<i>Spirodela polyrhiza</i>	LC								
LC	<i>Stachys alpina</i>	WL								
NT	<i>Stachys arvensis</i>	NT	A2c AOO trend	30						

International responsibility?	Proportion (%) of GB hecads in England	Native_archaeophyte	Comments
yes	100		Endemic to Cheddar Gorge. The estimate in 2014 includes nine currently unconfirmed mature individuals (L. Houston pers.comm.).
yes	100		Endemic: Recorded from Herefordshire, Gloucestershire. A new species described in Rich <i>et al.</i> (2014).
yes	100		Endemic to the Great Doward, Herefordshire. A new species described in Rich <i>et al.</i> (2014).
yes	100		Endemic to the Great Doward, where it is mainly found within tall, closed limestone woodland. A new species described in Rich <i>et al.</i> (2014).
yes	100		Endemic to the Morecombe Bay area (Rich <i>et al.</i> 2010b).
yes	100		A recently described species, endemic to limestone rocks and screes in Avon Gorge. Latest population count is from Houston pers. comm. (2013), and excludes 24 queries.
yes	100		Endemic to coastal cliffs between Combe Martin (Devon) and Culbone (Somerset) (Rich <i>et al.</i> 2010b).
yes	100		Endemic to Coldwell Rocks in the Wye Valley (Rich <i>et al.</i> 2010b).
yes			
yes	100		Endemic: Recorded from five localities along the shores of the Severn Estuary from Portishead to Clevedon. A new species described in Rich <i>et al.</i> (2014).
yes			
yes	100		Endemic to Cheddar Gorge.
yes			
yes	100		Endemic to the cliffs, slopes and rocks of St Vincent's Rocks in the Avon Gorge near Brunel's suspension bridge. A new species described in Rich <i>et al.</i> (2014).
yes	100		Endemic to the south coast of the Bristol Channel in North Devon and South Somerset (Rich <i>et al.</i> 2010b).
	89		
yes	100		Endemic to S. W. England (Rich <i>et al.</i> 2010b).
yes			Endemic to the Avon Gorge and Wye Valley (Rich <i>et al.</i> 2010b).
yes	100		L. Houston pers.comm. (2013).
	3		
			A confidence level of 85% was accepted for the AOO trend.
	100		
			The last record in England (and therefore GB) was in 1959 from the New Forest. See Foley (2004) for detail on the demise of this species in England and across N. W. Europe.
			Last seen in 1994, and searched for on numerous occasions over the past 20 years. See Section 6.4.
	86		
	95		
			Cultivated in GB by 1597 and first 'wild' record 1897. Probably a neophyte, but the European range reaches Belgium and northern France and so a UK distribution is not implausible.
75		Arch	

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
VU	<i>Stachys germanica</i>	EN	C2a(i)			5	14 - 470	N2		
LC	<i>Stachys palustris</i>	LC								
LC	<i>Stachys sylvatica</i>	LC								
LC	<i>Stellaria alsine</i> (<i>Stellaria uliginosa</i>)	LC								
LC	<i>Stellaria graminea</i>	LC								
LC	<i>Stellaria holostea</i>	LC								
LC	<i>Stellaria media</i>	LC								
LC	<i>Stellaria neglecta</i>	LC								
LC	<i>Stellaria nemorum</i>	LC								
LC	<i>Stellaria pallida</i>	LC								
VU	<i>Stellaria palustris</i>	VU	A2c AOO trend	>30						
NT	<i>Stratiotes aloides</i>	LC								
LC	<i>Suaeda maritima</i>	LC								
LC	<i>Suaeda vera</i>	LC						N2		
LC	<i>Subularia aquatica</i>	VU	D2			4?				
LC	<i>Succisa pratensis</i>	NT	A2a AOO trend	20						
LC	<i>Symphytum officinale</i>	LC								
WL	<i>Symphytum officinale</i> subsp. <i>bohemicum</i>	WL								
WL	<i>Symphytum officinale</i> subsp. <i>officinale</i>	WL								
LC	<i>Tamus communis</i>	LC						N2		
LC	<i>Tanacetum parthenium</i>	LC								
LC	<i>Tanacetum vulgare</i>	LC								
LC	<i>Taraxacum acutum</i>	LC							yes	
LC	<i>Taraxacum</i> agg.	LC								
VU	<i>Taraxacum akteum</i>	DD								
LC	<i>Taraxacum alatum</i>	LC								
LC	<i>Taraxacum ancistrolobum</i>	LC								
LC	<i>Taraxacum anglicum</i>	VU	AOO trend	>30						
LC	<i>Taraxacum arenastrum</i>	LC								
LC	<i>Taraxacum argutum</i>	LC								
	<i>Taraxacum atactum</i>	LC								
DD	<i>Taraxacum beeftinkii</i>	DD								
LC	<i>Taraxacum berthae</i>	LC								
	<i>Taraxacum boekmanii</i>	LC								
LC	<i>Taraxacum brachyglossum</i>	LC								

		International responsibility?	Proportion (%) of GB hectads in England	Native_archaeophyte	Comments
			100		There are five extant locations, two of which urgently require disturbance management. The population range estimate is based on counts from 2000-2013 (B. Betteridge pers. comm.).
			83		
			81		
			87		The threat status is based on a rough analysis of Threatened Plant Project (TPP) data collected from 2008-2010. A more sophisticated analysis is planned for 2014/15 using data collected by BSBI recorders.
			100		
			100		
			2		All England locations are in the Lake District. There are recent (post-1999) records from four out of a possible 11 locations. The most recent records from the remaining seven locations date from the mid-late 1970s (Porter & Halliday in press).
			85		Insufficient mapping data and more taxonomic work required.
					Insufficient mapping data and more taxonomic work required.
			87		
				Arch	
	yes		100		Endemic to England: chalk grassland, scattered distribution in S. England (nine vice-counties).
					Currently known from only a single location in North Hampshire, but native status is uncertain (Dudman & Richards 1997).
					Very locally frequent in hay-meadows liable to seasonal flooding (Dudman & Richards 1997). The AOO trend is based on perceived decline in England throughout the 20th Century (A.J. Richards pers. comm.).
					Only found in Essex, within saltmarsh grassland and on road verges subject to maritime flooding (Dudman & Richards 1997). This rarity is very little known and needs to be revisited and surveyed (A.J. Richards pers. comm.).

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Taraxacum bracteatum</i>	LC								
LC	<i>Taraxacum britannicum</i>	LC								
LC	<i>Taraxacum cambricum</i>	LC								
LC	<i>Taraxacum celticum</i>	LC								
LC	<i>Taraxacum cenabense</i>	LC								
LC	<i>Taraxacum cherwellense</i>	LC						yes		
LC	<i>Taraxacum commixtum</i>	LC								
LC	<i>Taraxacum cophocentrum</i>	LC								
LC	<i>Taraxacum cordatum</i>	LC								
LC	<i>Taraxacum cornubiense</i>	LC						yes		
LC	<i>Taraxacum degelii</i>	LC								
LC	<i>Taraxacum dilatatum</i>	LC								
LC	<i>Taraxacum drucei</i>	LC								
LC	<i>Taraxacum dunense</i>	LC								
LC	<i>Taraxacum duplidentifrons</i>	LC								
LC	<i>Taraxacum edmondsonianum</i>	LC								
LC	<i>Taraxacum euryphyllum</i>	LC								
LC	<i>Taraxacum excellens</i>	LC								
LC	<i>Taraxacum faeroense</i>	LC								
LC	<i>Taraxacum fulgidum</i>	LC								
LC	<i>Taraxacum fulvicarpum</i>	LC								
LC	<i>Taraxacum fulviforme</i>	LC								
LC	<i>Taraxacum fulvum</i>	LC								
LC	<i>Taraxacum gelertii</i>	LC								
LC	<i>Taraxacum glauciniforme</i>	LC								
LC	<i>Taraxacum haematicum</i>	LC								
LC	<i>Taraxacum hamatiforme</i>	LC								
LC	<i>Taraxacum hamatulum</i>	LC								
LC	<i>Taraxacum hamatum</i>	LC								
LC	<i>Taraxacum haworthianum</i>	LC								
LC	<i>Taraxacum hesperium</i>	LC							yes	
LC	<i>Taraxacum hexhamense</i>	LC							yes	
VU	<i>Taraxacum hygrophilum</i>	VU	D2			1				
LC	<i>Taraxacum inane</i>	LC								
LC	<i>Taraxacum inopinatum</i>	LC							yes	
LC	<i>Taraxacum lacistophyllum</i>	LC								
LC	<i>Taraxacum lancastriense</i>	LC							yes	
LC	<i>Taraxacum landmarkii</i>	LC								
LC	<i>Taraxacum laticordatum</i>	LC								
LC	<i>Taraxacum luteum</i>	LC								
LC	<i>Taraxacum maculosum</i>	LC								
DD	<i>Taraxacum margettsii</i>	LC						yes		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Taraxacum marklundii</i>	LC								
LC	<i>Taraxacum melanthoides</i>	LC								
	<i>Taraxacum naevosiforme</i>	LC								
LC	<i>Taraxacum naevosum</i>	LC								
LC	<i>Taraxacum nigridentatum</i>	LC								
LC	<i>Taraxacum nordstedtii</i>	LC								
LC	<i>Taraxacum obliquum</i>	VU	D2			<5				
LC	<i>Taraxacum oblongatum</i>	LC								
LC	<i>Taraxacum oellgaardii</i>	LC							yes	
LC	<i>Taraxacum olgae</i>	LC							yes	
	<i>Taraxacum ostenfeldii</i>	LC								
LC	<i>Taraxacum oxoniense</i>	LC								
LC	<i>Taraxacum palustre</i>	VU	AOO trend; ?D	>30						
LC	<i>Taraxacum palustrisquameum</i>	LC							yes	
LC	<i>Taraxacum parnassicum</i>	LC								
LC	<i>Taraxacum platyglossum</i>	DD								
	<i>Taraxacum polyodon</i>	LC								
LC	<i>Taraxacum porteri</i>	LC							yes	
LC	<i>Taraxacum proximiforme</i>	LC								
LC	<i>Taraxacum proximum</i>	LC								
LC	<i>Taraxacum pseudohamatum</i>	LC								
LC	<i>Taraxacum pseudolarssonii</i>	LC								
DD	<i>Taraxacum pseudonordstedtii</i>	LC						yes		
LC	<i>Taraxacum retzii</i>	LC								
LC	<i>Taraxacum richardsianum</i>	LC							yes	
LC	<i>Taraxacum roniae</i>	LC							yes	
LC	<i>Taraxacum rubicundum</i>	LC								
	<i>Taraxacum sagittipotens</i>	LC								
LC	<i>Taraxacum sahlinianum</i>	LC								
LC	<i>Taraxacum scanicum</i>	LC								
LC	<i>Taraxacum scoticum</i>	LC							yes	
LC	<i>Taraxacum sellandii</i>	LC								
LC	<i>Taraxacum sinuatum</i>	LC								
LC	<i>Taraxacum stenacrum</i>	LC								
	<i>Taraxacum stenoglossum</i>	LC								
LC	<i>Taraxacum stictophyllum</i>	LC								
LC	<i>Taraxacum subbracteatum</i>	LC								
LC	<i>Taraxacum subhamatum</i>	LC								
LC	<i>Taraxacum sublaeticolor</i>	LC								
LC	<i>Taraxacum subnaevosum</i>	LC							yes	
LC	<i>Taraxacum subundulatum</i>	LC								

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Taraxacum tamesense</i>	LC								
	<i>Taraxacum texelense</i>	DD								
LC	<i>Taraxacum tortilobum</i>	LC								
	<i>Taraxacum undulatum</i>	LC								
LC	<i>Taraxacum unguilobum</i>	LC								
LC	<i>Taxus baccata</i>	LC								
NT	<i>Teesdalia nudicaulis</i>	NT	A2a AOO trend	24						
EN	<i>Tephrosieris integrifolia</i>	VU	A2a AOO trend	38						
EX	<i>Tephrosieris palustris</i>	EX								
WL	<i>Teucrium chamaedrys</i>	WL								
EN	<i>Teucrium scordium</i>	EN	A2a AOO trend	74						
LC	<i>Teucrium scorodonia</i>	LC								
LC	<i>Thalictrum alpinum</i>	LC								
LC	<i>Thalictrum flavum</i>	LC								
LC	<i>Thalictrum minus</i>	LC								
LC	<i>Thelypteris palustris</i>	LC								
LC	<i>Thesium humifusum</i>	LC					N2			
LC	<i>Thlaspi arvense</i>	LC								
LC	<i>Thymus polytrichus</i> (<i>Thymus praecox</i>)	LC								
LC	<i>Thymus pulegioides</i>	LC								
LC	<i>Thymus serpyllum</i>	LC								
VU	<i>Thyselium palustre</i> (<i>Peucedanum palustre</i>)	VU	A2c EOO trend	47						
LC	<i>Tilia cordata</i>	LC								
LC	<i>Tilia platyphyllos</i>	LC								
LC	<i>Tofieldia pusilla</i>	LC								
EN	<i>Torilis arvensis</i>	EN	A2c AOO and EOO trend	68	74					
LC	<i>Torilis japonica</i>	LC								
LC	<i>Torilis nodosa</i>	LC								
LC	<i>Tragopogon pratensis</i>	LC								
LC	<i>Trichomanes speciosum</i>	LC								
DD	<i>Trichophorum cespitosum</i> (<i>Trichophorum cespitosum</i> subsp. <i>cespitosum</i>)	DD								
LC	<i>Trichophorum germanicum</i> (<i>Trichophorum cespitosum</i> subsp. <i>germanicum</i>)	LC								

International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
			Present in one estuarine saltmarsh in Lancashire (Dudman & Richards 1997). This rarity is very little known and needs to be revisited and surveyed (A.J. Richards pers. comm.).
	100		The sole native subspecies in England is <i>Tephroseris integrifolia</i> subsp. <i>integrifolia</i> . Decline is based on data collected for the BSBI Threatened Plant Project (TPP) and historical information supplied by D. A. Pearman.
			More work required. If accepted as native then it would be a threatened England-only taxon currently known from only one location.
	100		
	3		LC for the period 1930-1999 but a 50% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	97		
	87		LC for the period 1930-1999 but a 45% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		LC for the period 1930-1999 but a 32% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	80	Arch	
	98		LC for the period 1930-1999 but a 31% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		LC for the period 1930-1999 but a 47% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		
	85		
	98		
	2		
	98	Arch	
	89		LC for the period 1930-1999 but a 33% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	83		
			Assumed LC as species.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Trifolialis europaea</i>	LC								
LC	<i>Trifolium arvense</i>	LC								
VU	<i>Trifolium bocconeii</i>	EN	A2ac AOO trend; D	48		170	N2			
LC	<i>Trifolium campestre</i>	LC								
LC	<i>Trifolium dubium</i>	LC								
LC	<i>Trifolium fragiferum</i>	VU	A2c AOO trend	33						
LC	<i>Trifolium glomeratum</i>	LC					N2			
LC	<i>Trifolium incarnatum</i>	LC					N2			
LC	<i>Trifolium medium</i>	LC								
LC	<i>Trifolium micranthum</i>	LC								
LC	<i>Trifolium occidentale</i>	LC								
NT	<i>Trifolium ochroleucon</i>	VU	A2c AOO trend	37			N2			
LC	<i>Trifolium ornithopodioides</i>	LC								
LC	<i>Trifolium pratense</i>	LC								
LC	<i>Trifolium repens</i>	LC								
LC	<i>Trifolium scabrum</i>	LC								
LC	<i>Trifolium squamosum</i>	LC					N2			
LC	<i>Trifolium striatum</i>	LC								
VU	<i>Trifolium strictum</i>	VU	D2			5				
LC	<i>Trifolium subterraneum</i>	LC								
LC	<i>Trifolium suffocatum</i>	LC								
LC	<i>Triglochin maritima</i> (<i>Triglochin maritimum</i>)	LC								
LC	<i>Triglochin palustris</i> (<i>Triglochin palustre</i>)	NT	A2c AOO trend	27						
LC	<i>Trinia glauca</i>	LC					N2			
LC	<i>Tripleurospermum inodorum</i>	LC								
LC	<i>Tripleurospermum maritimum</i>	LC								
LC	<i>Tripleurospermum maritimum</i> subsp. <i>maritimum</i>	LC								
LC	<i>Tripleurospermum maritimum</i> subsp. <i>vinicaule</i>	LC								
LC	<i>Trisetum flavescens</i>	LC								
LC	<i>Trollius europaeus</i>	LC								
EN	<i>Turritis glabra</i> (<i>Arabis glabra</i>)	EN	A2c AOO and EOO trend	54	70					
LC	<i>Tussilago farfara</i>	LC								

International responsibility?	Proportion (%) of GB hecctads in England	Native_archaeophyte	Comments
			LC for the period 1930-1999 but a 31% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	77		
	100		Surveys of all sites in 2012 suggest a c.55% decline in the past 10 years.
	92		
	100		LC for the period 1930-1999 but a 36% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		The sole native subspecies in England is <i>Trifolium incarnatum</i> subsp. <i>molinerii</i> .
	85		
yes	90		
	100		AOO trend makes this species VU, and EOO trend is on margins of NT/VU.
	86		
	78		LC for the period 1930-1999 but a 33% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	90		LC for the period 1930-1999 but a 49% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	78		
			Absent from 50% of locations in 2012 and c.80% of locations in 2013, but this trend is likely to reflect short-term suboptimal conditions for establishment. If this trend is not short-term, then the threat status will need to be re-assessed.
	94		LC for the period 1930-1999 but a 31% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		Formerly in Wales, now RE (Dines 2008).
	100		
		Arch	
			Assumed LC as species.
			Assumed LC as species.
	82		
			LC for the period 1930-1999 but a 36% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100		

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Typha angustifolia</i>	LC								
LC	<i>Typha latifolia</i>	LC								
LC	<i>Ulex europaeus</i>	LC								
LC	<i>Ulex gallii</i>	LC								
LC	<i>Ulex minor</i>	LC					N2			
LC	<i>Ulmus glabra</i>	LC								
LC	<i>Ulmus minor sensu Stace</i>	LC								
LC	<i>Ulmus procera</i>	LC					N2			
LC	<i>Umbilicus rupestris</i>	LC								
LC	<i>Urtica dioica</i>	LC								
LC	<i>Urtica dioica</i> subsp. <i>dioica</i>	LC								
WL	<i>Urtica dioica</i> subsp. <i>galeopsifolia</i>	WL								
LC	<i>Urtica urens</i>	LC								
LC	<i>Utricularia australis</i>	LC								
WL	<i>Utricularia breonii</i>	WL				1?				
DD	<i>Utricularia intermedia</i> s.l.	DD								
DD	<i>Utricularia intermedia</i> s.s.	DD								
LC	<i>Utricularia minor</i>	VU	A2c AOO and EOO trend	40	42					
DD	<i>Utricularia ochroleuca</i>	DD								
DD	<i>Utricularia stygia</i>	DD								
LC	<i>Utricularia vulgaris</i> s.l.	LC								
LC	<i>Utricularia vulgaris</i> s.s.	LC								
LC	<i>Vaccinium microcarpum</i>	WL								
LC	<i>Vaccinium myrtillus</i>	LC								
LC	<i>Vaccinium oxycoccos</i>	LC								
LC	<i>Vaccinium uliginosum</i>	LC								
LC	<i>Vaccinium vitis-idaea</i>	LC								
LC	<i>Valeriana dioica</i>	NT	A2c AOO trend	25						
LC	<i>Valeriana officinalis</i>	NT	A2c AOO trend	20						
LC	<i>Valeriana officinalis</i> subsp. <i>collina</i>	WL								
WL	<i>Valeriana officinalis</i> subsp. <i>sambucifolia</i>	WL								
WL	<i>Valerianella carinata</i>	LC								
EN	<i>Valerianella dentata</i>	EN	A2c AOO trend	52						
LC	<i>Valerianella eriocarpa</i>	LC					N2			
LC	<i>Valerianella locusta</i>	LC								
EN	<i>Valerianella rimosa</i>	EN	A2c AOO trend	74						

International responsibility?	Proportion (%) of GB hectads in England	Native/archaeophyte	Comments
	94		
	100		
	88		
			Taxonomic work ongoing.
	75	Arch	
			Putative <i>U. bremii</i> plants are restricted to a single New Forest site, but there is some doubt over the identification of the species.
			Issues with taxonomy (Richards 1994; Stace 2010); possibly a subspecies or variety of <i>V. oxycoccus</i> . More work is required to determine status.
	5		LC for the period 1930-1999 but a 40% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	83		
			Insufficient mapping data and more taxonomic work required.
			Insufficient mapping data and more taxonomic work required.
	85	Arch	
	95	Arch	
	100		Previously regarded as a neophyte, but now considered to be native in Dorset and possibly also the Isle of Wight (Pearman & Edwards 2002). Its distribution appears to be stable in coastal areas where it is thought to be native, hence an assessment of LC. However, it has long since gone from a wide scatter of mainly inland sites where it occurred, almost invariably as a 'casual', of ruderal habitats, which occasionally included arable sites (Pearman & Edwards 2002).
	96	Arch	

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Verbascum lychnitis</i>	LC								
LC	<i>Verbascum nigrum</i>	LC								
LC	<i>Verbascum pulverulentum</i>	LC					N2			
LC	<i>Verbascum thapsus</i>	LC								
LC	<i>Verbena officinalis</i>	LC								
LC	<i>Veronica agrestis</i>	LC								
LC	<i>Veronica anagallis-aquatica</i>	LC								
LC	<i>Veronica arvensis</i>	LC								
LC	<i>Veronica beccabunga</i>	LC								
LC	<i>Veronica catenata</i>	LC								
LC	<i>Veronica chamaedrys</i>	LC								
LC	<i>Veronica hederifolia</i>	LC								
LC	<i>Veronica hederifolia</i> subsp. <i>hederifolia</i>	LC								
LC	<i>Veronica hederifolia</i> subsp. <i>lucorum</i>	LC								
LC	<i>Veronica montana</i>	LC								
LC	<i>Veronica officinalis</i>	NT	A2c AOO trend	22						
LC	<i>Veronica scutellata</i>	NT	A2c EOO trend		23					
LC	<i>Veronica serpyllifolia</i>	LC								
NT	<i>Veronica serpyllifolia</i> subsp. <i>humifusa</i>	NT	D			<1000				
LC	<i>Veronica serpyllifolia</i> subsp. <i>serpyllifolia</i>	LC								
LC	<i>Veronica spicata</i>	LC								
EN	<i>Veronica triphyllos</i>	CR	A2c AOO trend; C2a(i); D		1	c.25				
EN	<i>Veronica verna</i>	EN	A2a AOO trend	>50%	10	>2500				
LC	<i>Viburnum lantana</i>	LC					N2			
LC	<i>Viburnum opulus</i>	LC								
VU	<i>Vicia bithynica</i>	LC								
LC	<i>Vicia cracca</i>	LC								
LC	<i>Vicia hirsuta</i>	LC								
LC	<i>Vicia lathyroides</i>	LC								
NT	<i>Vicia lutea</i>	VU	A2c AOO trend	42						
NT	<i>Vicia orobus</i>	VU	D1			<800				
VU	<i>Vicia parviflora</i>	VU	A2c AOO trend	31			N2			
LC	<i>Vicia sativa</i>	LC								
WL	<i>Vicia sativa</i> subsp. <i>nigra</i>	WL								
WL	<i>Vicia sativa</i> subsp. <i>sativa</i>	WL								
WL	<i>Vicia sativa</i> subsp. <i>segetalis</i>	WL								

International responsibility?	Proportion (%) of GB hectads in England	Native_archaeophyte	Comments
	100		
	99		
	100		
	85	Arch	
		Arch	
	77		
	91		
		Arch	
		Arch	
		Arch	
			Threat assessment is based on all available information, but it is possible that the taxon is under-recorded and may in future be downgraded to LC.
			Assumed LC as species.
			LC for the period 1930-1999 but a 43% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	100	Arch	The threat status is based on historical decline since 1930 and includes only native locations. There is now only one, extremely vulnerable extant native site. All four introduction sites hold good numbers and are managed sympathetically, but are not included for the reasons outlined in Section 4.5.
	100		Three further locations have been lost since 1997, leaving only 10 extant locations within just two hectads.
	96		
	76		
	95		LC for the period 1930-1999 but a 58% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			LC for the period 1930-1999 but a 36% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	81		A confidence level of 90% was accepted for the AOO trend.
	100		
			Insufficient mapping data as a subspecies.
		Arch?	Probably an archaeophyte but insufficient mapping data as a subspecies.
		Arch?	Stace (2010) claims this subsp. as an archaeophyte (Stace 2010) but it is considered to be native in Sell & Murrell (2009). Insufficient mapping data and more work required.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
LC	<i>Vicia sepium</i>	LC								
LC	<i>Vicia sylvatica</i>	LC								
LC	<i>Vicia tetrasperma</i>	LC								
LC	<i>Vinca minor</i>	LC								
LC	<i>Viola arvensis</i>	LC								
NT	<i>Viola canina</i>	VU	A2c AOO and EOO trend	41	42					
NT	<i>Viola canina</i> subsp. <i>canina</i>	VU	A2c AOO and EOO trend							
EN	<i>Viola canina</i> subsp. <i>montana</i>	EN	D			2	c.200			
LC	<i>Viola hirta</i>	LC								
NT	<i>Viola kitaibeliana</i>	NT	D				c.1500			
VU	<i>Viola lactea</i>	EN	A2c AOO and EOO trend	58	60					
LC	<i>Viola lutea</i>	NT	A2c AOO trend	26						
LC	<i>Viola odorata</i>	LC								
LC	<i>Viola palustris</i>	LC								
LC	<i>Viola palustris</i> subsp. <i>juressi</i>	LC								
LC	<i>Viola palustris</i> subsp. <i>palustris</i>	LC								
EN	<i>Viola persicifolia</i>	CR	A2c AOO trend; C2a(ii)			3	<100			
LC	<i>Viola reichenbachiana</i>	LC								
LC	<i>Viola riviniana</i>	LC								
LC	<i>Viola rupestris</i>	LC								
NT	<i>Viola tricolor</i>	NT	A2c AOO trend	28						
LC	<i>Viola tricolor</i> subsp. <i>curtisii</i>	NT								
NT	<i>Viola tricolor</i> subsp. <i>tricolor</i>	NT								
LC	<i>Viscum album</i>	LC								
LC	<i>Vulpia bromoides</i>	LC								
LC	<i>Vulpia ciliata</i>	LC						N2		
LC	<i>Vulpia fasciculata</i>	LC						N3		
LC	<i>Vulpia myuros</i>	LC								
LC	<i>Vulpia unilateralis</i>	LC								
NT	<i>Wahlenbergia hederacea</i>	NT	A2c AOO trend	21						
VU	<i>Wolffia arrhiza</i>	LC								
EN	<i>Woodsia ilvensis</i>	CR	C2a(ii)			1	68			
LC	<i>Zannichellia palustris</i>	LC								
WL	<i>Zannichellia palustris</i> subsp. <i>palustris</i>	WL								
WL	<i>Zannichellia palustris</i> subsp. <i>pedicellata</i>	WL								
NT	<i>Zostera marina</i>	VU	A2c AOO and EOO trend	51	57					

International responsibility?	Proportion (%) of GB hectads in England	Native_archaeophyte	Comments
			LC for the period 1930-1999 but a 42% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
	92		
	75	Arch	
		Arch	
			Assumed VU as species.
	100		
	91		
	100		
possibly			
	100		Plants have not been recorded at Woodwalton Fen NNR since 2007, although seeds are thought to be long-lived in the soil. The species was recorded at Wicken Fen for the first time in 16 years in 2014.
	91		
	100		
	94		
	96		The sole native subspecies in England is <i>Vulpia ciliata</i> subsp. <i>ambigua</i> .
	83	Arch	
	100		Native or alien.
			A confidence level of 85% was accepted for the AOO trend.
	96		LC for the period 1930-1999 but a 41% decline detected when assessing 1987+ data as a proportion of all records including pre-1930 data. See Section 6.7.
			Population estimate from 2012. Two introductions have not been included in the assessment for the reasons outlined in Section 4.5.
	82		
			Insufficient mapping data and more taxonomic work required.
			Insufficient mapping data and more taxonomic work required.

GB Red List status	Taxon	England Red List status	Threat criteria	% AOO decline	% EOO decline	Number of locations	Population estimate	European edge of range?	England endemic?	England near endemic?
VU	<i>Zostera noltei</i>	VU	A2c AOO trend	44						

International responsibility?
Proportion (%) of GB hecctads in England
Native__archaeophyte

Comments

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9 Excluded taxa

Details of taxonomic coverage were given in Section 3.1 above. In addition, the following taxa that are regarded as native or archaeophyte in GB are also excluded because their English occurrences are considered to be

neophyte or casual only. These taxa are given the IUCN category of 'Not Applicable' (NA) in this Red List. We acknowledge that this list is probably incomplete, and would welcome correspondence regarding further candidates.

Table 12. Taxa that are neophyte or casual in England but are considered native to other parts of Great Britain.

Taxon	England status	Comment
<i>Arabis alpina</i>	NA	Neophyte in England, naturalised in N. Somerset and Mid-West Yorkshire
<i>Cicerbita alpina</i>	NA	Neophyte in England, naturalised
<i>Crassula aquatica</i>	NA	Neophyte in England, assumed native in Scotland
<i>Draba aizoides</i>	NA	Neophyte in England, naturalised
<i>Gnaphalium supinum</i>	NA	Neophyte in England, intentionally introduced (Park <i>et al.</i> 1962)
<i>Juncus trifidus</i>	NA	Neophyte in England, intentionally introduced (Park <i>et al.</i> 1962)
<i>Linnaea borealis</i>	NA	Thought to be a neophyte in England, but see Swan (1993)
<i>Minuartia sedoides</i>	NA	Neophyte in England, intentionally introduced (Park <i>et al.</i> 1962)
<i>Polygonum boreale</i>	NA	Neophyte in England, grass seed contaminant
<i>Potamogeton epihydrus</i>	NA	Neophyte in England, introduced to canals in S.W. Yorkshire and S. Lancashire
<i>Potentilla rupestris</i>	NA	Neophyte in England, S. Lancashire, casual
<i>Salix arbuscula</i>	NA	Neophyte in England, intentionally introduced (Park <i>et al.</i> 1962)
<i>Salix reticulata</i>	NA	Neophyte in England, intentionally introduced (Park <i>et al.</i> 1962)
<i>Saxifraga rosacea</i>	NA	Neophyte in England
<i>Sibbaldia procumbens</i>	NA	Neophyte in England, intentionally introduced (Park <i>et al.</i> 1962)
<i>Silene viscaria</i> (<i>Lychnis viscaria</i>)	NA	Neophyte in England, casual

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Appendix A: Assessment of conservation status of English native Hawkweeds (*Hieracium* species)

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May 2014

The large number of relatively similar Hawkweed (*Hieracium*) species which are notoriously difficult to identify has resulted in comparatively little reliable information available on which to assess their conservation priorities. Following the taxonomic revision of the 412 species of *Hieracium* in Britain and Ireland by Sell & Murrell (1996), McCosh & Rich (2011) published distribution maps for the taxa based on David McCosh's *Hieracium* database. The database took about 30 years and a huge amount of work to compile, and serves its primary objective eminently well of enabling distributions to be mapped. However, as it is based primarily on verified herbarium specimens in relatively few herbaria, is not comprehensive either geographically or temporarily, and only includes data from relatively limited recent field work. As such there are limitations in its application to conservation assessments compared to other plant distribution data, especially in being able to detect declines. None-the-less, using a broad approach, McCosh & Rich (2011) provide assessments for all the taxa in Britain and Ireland.

As part of development of a specific Red List for England, the status of *Hieracium* in England has been reviewed to refine the conservation statuses to England only. Rich (2013a) reviewed and assessed the status of 52 priority *Hieracium* species which were endemic or near-endemic to England, coupled with field work on three of the rarest species in the Lake District (Rich 2013b). Here, the status of all 145 native or probably native *Hieracium* species has been revised.

The approach taken has been to assess the

statuses based on the best information available using the IUCN (2001) definitions and criteria, taking into account the quality of the data. In effect, the following three criteria have been used in sequence: population sizes, the total number of localities recorded and an estimate of decline (50% or more pre/post-1960).

1. IUCN definition (1): Population size

These data, where available, are usually the most reliable for *Hieracium* as they are specific and recent. However, there are very few recent full population censuses for purely English species e.g. *Hieracium vagicola* (Sawtschuk & Rich 2008). The population data do not allow the more specific number of mature individuals criterion to be utilised. 12 taxa were assessed using this criterion.

Criterion D1: Population very small or restricted

Population size estimated to number fewer than 50 mature individuals = **CR**

Population size estimated to number fewer than 250 mature individuals = **EN**

Population size estimated to number fewer than 1000 mature individuals = **VU**

2. IUCN definition (11): Location

Of the three IUCN definitions based on geography/locations – Extent of occurrence (EOO), Area of occupancy (AOO) and Location – the total number of localities is the simplest and most appropriate use of the McCosh database. The total number of localities recorded (irrespective of date)

is estimated from the database from the different locality names (which may not always represent different locations, or hectads). The EOO or AOO could be estimated crudely from the number of hectads occupied, but most hawkweed populations occupy limited areas in severely fragmented habitat with significant discontinuities between them. 23 taxa were assessed using this Criterion.

Criterion B1a: Geographic range

Severely fragmented or known to exist at only a single location = **CR**

Severely fragmented or known to exist at five of fewer locations = **EN**

3. IUCN definition (6): Continuing decline

Of the two definitions relating to decline (Reduction and Continuing decline respectively), the continuing decline definition is preferred as it can be inferred from the ratio of pre/post 1960 records, rather than ratio of extant/all localities which is limited by lack of recent field work for many species.

In practice, given the low resolution of the data, only a reduction of <50% (EN) is accepted as the analysis is very crude. For some areas, such as Derbyshire where there has been very little recent field work, declines have been reviewed and rejected if they are thought to be artefacts of the data. Ten taxa were assessed using this criterion.

Criterion A2: Reduction in population size without causes being understood or ceased

Reduction in population of >80% = **CR**

Reduction in population of >50% = **EN**

Reduction in population of >30% = **VU**

This approach leaves a number of taxa with very limited distributions in England regarded as IUCN **VU** by McCosh & Rich (2011) such as *H. lakelandicum* as **NT** or **LC**. Further work on these species should be prioritised based on number of locations in the first instance.