



Definition of Favourable Conservation Status for Marsh Saxifrage *Saxifraga hirculus*

Defining Favourable Conservation Status Project

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About the DFCS project

Natural England's Defining Favourable Conservation Status (DFCS) project is defining the minimum threshold for thriving habitats and species in England.

We are doing this so we can say what good looks like, recommend actions to get them there and keep them that way.

Using Natural England's expert evidence and specialist knowledge, our DFCS definitions will set out our aspirations for these species and habitats in England.

We are publishing these tools so that you, our partners and decision-makers can do your bit for nature, better.

As we publish more of our work, the format of our definitions may evolve, however the content will remain largely the same.

This definition has been prepared using current data and evidence. It represents Natural England's view of FCS based on the best available information at the time of production.

All blocks of evidence within the definition should be given one of three confidence levels [High, Moderate, Low], based on the quality of the evidence, its applicability and the level of agreement.

Quality of evidence is defined as follows:

- Robust evidence is that which has been reported in peer-reviewed literature, or other reputable literature, from well-designed experiments, surveys or inventories that shows signs of being applicable generally.
- Medium evidence is that reported from well-designed experiments, surveys or inventories but from only one or a small number of sites, with uncertainty over its more general applicability, or is correlational or circumstantial evidence.
- Limited evidence includes 'expert opinion', based on knowledge of ecological factors that plausibly suggest an effect, but there is no circumstantial or direct evidence available.

Confidence levels are assigned as shown in the following matrix (after IPCC 2010):

High agreement Limited evidence	High agreement Medium evidence	High agreement Robust evidence
Medium agreement Limited evidence	Medium agreement Medium evidence	Medium agreement Robust evidence
Low agreement Limited evidence	Low agreement Medium evidence	Low agreement Robust evidence

Introduction

This document sets out Natural England's view on the contribution England needs to make to achieve Favourable Conservation Status (FCS) for **Marsh Saxifrage** *Saxifraga hirculus*. It is the aim of the Habitats Directive to achieve and maintain FCS. The England contribution is defined in terms of the natural range and population of the species and the extent of habitat necessary for long-term maintenance of populations.

This section contains the summary statement of the England contribution. Sections 2 – 5 describe the evidence considered when defining FCS for each of the three parameters. Annex 1 sets out the UK and England position in the 3rd Habitats Directive report.

This document does not include any action planning, or describe actions, to achieve FCS where the species is not considered to be in FCS. These will be presented separately, for example within restoration strategies.

England contribution to FCS

Marsh Saxifrage is a stoloniferous perennial of calcareous flushes and rills with a naturally restricted range in the UK, now being confined to the Pennine Moorlands in England and similar habitats in Scotland and Northern Ireland. It is a pan-boreal species with outliers in Europe as far south as the Swiss Jura. The English populations also lie towards the southerly edge of its range although a lowland Cheshire site destroyed by development in the 19th Century suggests that it is not intrinsically an upland species even at these low latitudes. This supposition is supported by the persistence of a population in Denmark – an entirely low-lying country.

Inconsistencies in what has been recorded over time (presence/flowers/plants/ramets) make it difficult to assess population trends in the UK. Known site number has remained relatively constant with few recorded losses counterbalanced by the discovery of "new" sites. These discoveries, however, are likely to represent long-established colonies overlooked due to a combination of remoteness and limited flowering and the overall trend is one of slight decline.

A history of heavy and persistent sheep-grazing at all the extant English sites has severely suppressed flowering and seed set/survival for many decades if not centuries and, whilst compensatory vegetative reproduction has maintained populations this is likely to have resulted in reduced genetic diversity within sites and limited genetic exchange between sites (exacerbated by significant disjunctions). Pollination is insect-mediated, further restricting gene flow.

Recent attempts to improve flowering by the enclosure of grazing livestock have been successful in this regard but there has been a significant cost in the form of reduced clonal maintenance resulting in much reduced ramet numbers in some enclosed sites – dramatically so in two cases.

The England contribution to FCS for *Saxifraga hirculus* is therefore:

- Sustainable populations, totalling 40+ colonies at all 19 sites in the Pennines.

Populations maintained at sustainable levels at all sites over time. *(Note: in order to encourage genetic diversity, appropriate management will be required, from time to time, to encourage both vegetation expansion and flowering/seed production. A fall in ramet number during flowering/fruitletting phases is to be expected and must be accounted for when determining sustainable population size).*

Definitions and ecosystem context

Species definition

S1528 Marsh saxifrage, *Saxifraga hirculus* L.

Saxifraga hirculus* ssp. *hirculus - there are no variants or subspecies in the UK although a second European subspecies *S. hirculus* ssp. *alpina* (Engler) Á.Löve is found in Iceland and Svalbard. Other subspecies are claimed for North America but genetic support for these appears weak.

Source: *Atlas Florae Europaeae volume 12 (Jalas, J. and others)*

Date: 1999

Confidence: High

Threat status

Red list status:

- **Global:** Least Concern Source: *IUCN Red List 2017*
- **European:** Data Deficient Source: *European Red List, IUCN 2011*
- **GB:** Vulnerable Source: *The Vascular Plant Red Data List for Great Britain, JNCC 2005*
- **England:** Least Concern Source: *A Vascular Plant Red List for England BSBI 2014*

It will be possible for a species to be Least Concern in England under IUCN Red List criteria and yet for it to be in unfavourable conservation status, as the IUCN criteria for determining threat (primarily decline in Area of Occupancy (AoO) or Extent of Occurrence (EoO) for a taxon which is above the minimum thresholds set for site number and overall population size) differ from those used to determine FCS. It is most likely to occur when individual sites fall below the accepted sustainable levels.

Habitat for the species definition

In England *Saxifraga hirculus* is now restricted to a range of calcareous springs, flushes and rills between 370 m and 730m above sea level in the North Pennines on both sides of the primary watershed. These flushes largely fall into NVC communities M9 (*Carex rostrata-Calliargon cuspidatum/giganteum* mire), M10 (*Pinguiculo-Caricetum dioicae* mire), M37 (*Cratoneuron commutatum-Festuca rubra* spring) and M38 (*Cratoneuron commutatum-Carex nigra* spring) with *Saxifraga hirculus* plants being particularly concentrated in peripheral areas grading into the surrounding vegetation; often forming a zone attributable to U5c (*Nardus stricta-Galium saxatile* grassland: *Carex panicea-Viola riviniana* sub-community). They are characterised by constantly flowing water usually issuing from calcareous shales – rarely directly from the underlying Carboniferous Limestone. The habitat is open to grazing by sheep and rabbits for much of the year (except where recently exclosed to encourage flowering) and the plant community remains short and open, even when landscape-scale grazing pressure appears light, due to the high palatability and mineral richness of the flush vegetation in comparison to the generally tough and nutrient poor character of the contextual dwarf-shrub heath and grass moorland. The flushes often have very small surface areas and may be separated by extensive areas of unsuitable land thus limiting opportunities for dispersal of both seeds and probably pollen (although the vectors for both remain to be identified). The habitat is dominated by bryophytes (so-called “brown moss” communities) and *Saxifraga hirculus* stolons appear to run mainly just below the surface of these bryophyte mats such that plants are hard to detect during the winter and early spring, only becoming evident once fresh leaf growth commences. Swiss studies suggest that permanent water flows from 8 to 14 cms

below the bryophyte surface are essential for the species to persist. Flowering is limited by grazing but this encourages ramification of the shoots from axillary buds and there appears to be a trade-off between vegetative expansion and flowering shoot production.

Whilst the precise habitat required by *Saxifraga hirculus* is restricted there do appear to be suitable flushes which are unoccupied although their true suitability is difficult to assess given the variability in both water flows and mineral quality. Within the occupied range there is no indication of significant recent change in the level of flush occupancy. Two of the three lowest known English sites; Balderhead (410 m) and Knutsford Moor (c.50 m) have been lost but in both cases habitat destruction was responsible – the former in 1975 and the latter in the 19th century. The Arkengarthdale site lies at 370 m. There is, therefore, currently no evidence of negative impacts from climate change although both the boreal distribution of the species and its exacting habitat requirements suggest that it could be vulnerable.

Sources:

Roberts, F.J. Date: 2010

Confidence: High

O'Reilly, J. Date: 2016

Confidence: High

Kelly, P. Date: 1998, 1999, 2000

Confidence: High

Ecosystem context

The genetics of *Saxifraga hirculus* was the subject of a study (Oliver, Hollingsworth & Gornall: Heredity (2006)) which looked at chloroplast DNA phylogeography across Europe and North America. The findings suggest that the northern European population is fairly uniform with three haplotypes present in the UK two of which were found nowhere else. Two of the three are found in England; one is shared with northern Scotland only and the other with Northern Ireland, Denmark and Iceland. The haplotype found at the species' only site in southern Scotland appears to be globally unique at the current level of sampling. Genetic diversity is known to be much greater in North America.

The English populations lie towards the southern limits of the species in western Europe although there is a very southerly outlier in the Swiss Jura.

The species has a high allocation of resources to its large and nectariferous flowers and, given the naturally highly fragmented nature of its habitat, insect mediated gene flow would appear important in maintaining genetic diversity in the species – although a range of Diptera are suggested as pollinators (Vittoz, Wyss & Gobat: Biol. Cons. (2006)) this aspect has not been studied in the UK. Likewise the seed, which is relatively large and ill-equipped for long-distance unaided dispersal, presumably has a vertebrate vector but this has also not been studied although Danish references tentatively suggest deer may be important – at least in Denmark.

As indicated above, herbivory encourages the ramification of shoots which, over time leads to the development of multiple free-living “ramets” at the expense of flower production and, likewise flowering suppresses ramification and so there is a trade-off between the two reproductive/persistence strategies. Work on other ramifying taxa such as *Trifolium repens* indicates the propensity for local populations to drift rapidly to monoclonality and it may be that individual, rarely flowering populations in small flushes have attained this state – however this has yet to be studied. Observations have been made on exclosed English populations that most seed capsules appear to collapse at the end of the season resulting in prolific seedling regeneration in situ (although the exclosure which encourages flowering also prevents some/most potential seed vectors from accessing the ripe capsules so this may not be a natural occurrence) More research is needed to clarify both pollen and seed transfer.

Sources:

Oliver and others Date: 2006 **Confidence:** High

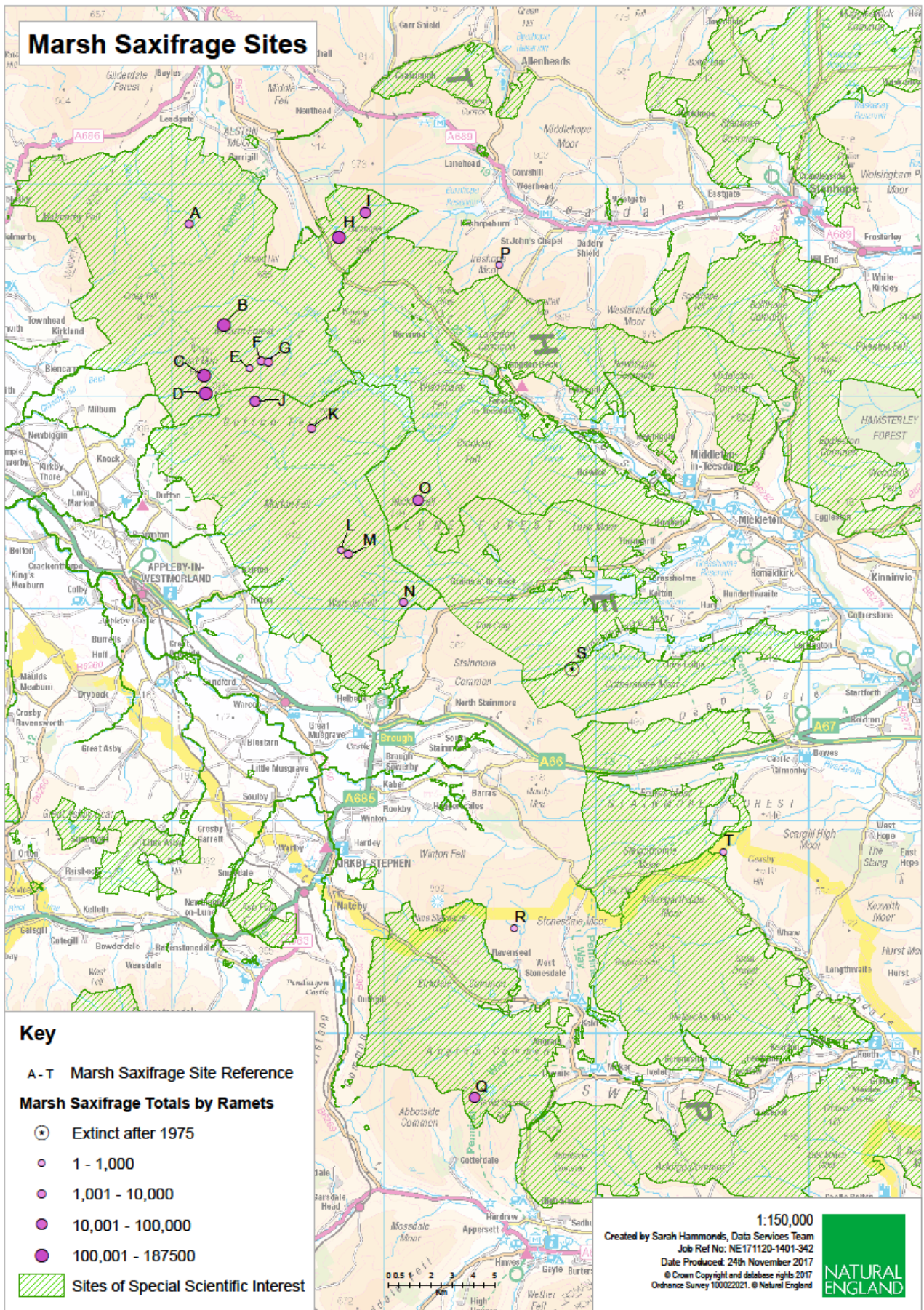
Vittoz and others Date: 2006 **Confidence:** High

Kelly, P. Date: 1998, 1999 **Confidence:** High

Natural range and distribution

Metric
<p>Sites and colonies</p> <p>Given that the habitat is sharply defined (flush/spring/rill) even within an expansive landscape of blanket bog or moorland, individual sites generally occupying no more than a few square metres are relatively easy to identify, describe and relocate. Many sites are separated by many hundreds of metres from their nearest neighbours. However sites may be very locally fragmented – occasionally two or three springs will issue from the same stratum within a few metres of each other or a rill will appear above and disappear below ground along its length depending on substrate and local topography. On other occasions patches of apparently suitable flush may not be occupied by <i>Saxifraga hirculus</i> such that discrete colonies can be identified even within a single large hydrographic unit. The term colony has been reserved for populations separated by up to a few tens of metres for such reasons and is a potential source of confusion although very accurate recording of both sites and colonies has been undertaken across the UK range and future recording should reference this.</p> <p>Sources: Roberts, F.J. Date: 2010 Confidence: High O'Reilly, J. Date: 2016 Confidence: High</p>
<p>Historical range</p> <p>Within England only one site is known to have been lost within the last 100 years. This is at Balderhead in Co. Durham and the loss of <i>Saxifraga hirculus</i> resulted from drainage activities in 1975. The only other English site known to have been lost was at Knutsford Moor in Cheshire which was destroyed in the 19th century when the land became used as the town rubbish tip, much reducing the species English range.</p> <p>Within the last 100 years a maximum of 19 sites were known at any one time with a total of at least 48 colonies.</p> <p>Sources: Roberts, F.J. Date: 2010 Confidence: High O'Reilly, J. Date: 2016 Confidence: High Kelly, P. Date: 1998, 1999, 2000 Confidence: High</p>
<p>Current range</p> <p>In 2012 a “new” site was discovered on an upwelling tufa spring at Mud beck in Arkengarthdale, Yorkshire restoring the known range to 18 sites and 42 colonies. More recently another site has been discovered at an altitude of 530m at Red Mea in Swaledale, Yorkshire increasing the number of sites to 19 and additional colonies were found at Hard Hill and Johnny’s Flush in Cumbria in 2015 and on Great Shunner Fell in Yorkshire in 2016 increasing the colony total to 48. It is much more likely that these represent the discovery of long-occupied sites previously overlooked rather than recent range expansions or colonisation events</p>

Marsh Saxifrage Sites



Sources:

- Roberts, F.J. Date: 2010 **Confidence: High**
- O'Reilly, J. Date: 2016 **Confidence: High**
- Robinson, L. Date: 2012 **Confidence: High**

Range required for future maintenance of populations and diversity

Given that the English range has not fundamentally changed within the last century it is believed that the current range meets the need for future maintenance of the population. However, the ability for populations to exchange genetic material through either pollen or seed dispersal will be important in the long term. It is possible, should the the appropriate research on vectors indicate it, that stepping-stone sites may be required to enable genetic exchange between sites and colonies. The limited availability of sites with the appropriate hydrogeology, however, restricts options in this respect.

To preserve the natural range, populations contributing to both AoO and EoO (as determined by the Alpha-Hull method currently employed in GB and England-level IUCN threat assessments) must be maintained. For EoO maintenance, in particular, the peripheral sites are critical.

Sources:

Roberts, F.J. Date: 2010 Confidence: High

O'Reilly, J. Date: 2016 Confidence: High

Kelly, P. Date: 1998, 1999 Confidence: High

Potential for restoration of the natural range

There is a limited supply of apparently suitable unoccupied flushes within the overall area suggesting there is potential for some limited range expansion if vector studies indicate that this is required. Such enhancement of the range would have no foreseeable impacts on either the habitat or other species. If water chemistry and flow characteristics prove suitable the establishment would not be technically difficult. However, restoring the full former range is not feasible due to the complete destruction of the site in Cheshire (Knutsford Moor).

Sources:

Roberts, F.J. Date: 2010 Confidence: High

MacGregor, M. Date: 2008 Confidence: High

Favourable range

Current range is deemed favourable (pending the outcome of population dynamics studies). Monitoring of sites should be undertaken at 6-yearly intervals to determine conservation status in this regard.

Comparison with situation in 1994

Two additional sites (comprising three colonies) and four additional colonies (at three of the sites known at the time) have been discovered since 1994.

Population

Population metric

Ramet – an individual, self-supporting rosette/shoot.

This is the only meaningful and repeatable assessable vegetative unit although most such units are produced clonally under existing grazing pressure. Ideally genets (the products of unique sexual reproduction events) would be distinguished given the evolutionary significance of genetic exchange in this fragmented environment which is so vulnerable to climate-induced change. However the routine field assessment of genets is not feasible with present technology and is likely to remain so for the foreseeable future.

NB: there are significant problems with this metric in that hard grazing increases vegetative ramification at the expense of flowering thereby suppressing genetic exchange potential – so an increase in ramet number may indicate a negative development in a population. This must be borne in mind when assessing the significance of trends using this metric. It might be that ramet/genet ratio would provide an ideal metric for this species in combination with absolute ramet thresholds but this has yet to be determined.

Historical populations

Early counts were of flowers but work undertaken in the late 1980s (Taylor (1987)), which introduced counts of ramets for the first time, showed flowering to be an extremely rare event in England and therefore a poor indicator of true population size. Since the 1987 report ramet counts have been approximately stable over all (although some sites have suffered decreases following exclosure – either for habitat restoration reasons or to specifically induce flowering and fruiting in the *Saxifraga hirculus* population). Counts made in 2015 and 2016 (O'Reilly (2016)) at a sub-set of the populations are consistently higher than previous ramet counts at the same locations. However, the researcher suggests this is more likely a consequence of systematic differences in the monitoring methodology than a real increase in ramet population size.

Sources:

Taylor, I. Date: 1987 **Confidence: High**

O'Reilly, J. Date: 2016 **Confidence: High**

Roberts, F.J. Date: 2010 **Confidence: High**

Current population

	Colony	Centred on:	Area m ² (est)	Number of Ramets (est)	Total number of ramets for site
Site A: Cash Burn	A1	NY70909.37995	132	1,400	1,800
	A2	NY70822.38100	48	380	
	A3	NY70837.38138	<1	10	
Site B: Hard Hill	B1	NY72390.33342	200	98,000	119,650
	B2	NY72454.33362	20	650	
	B3	NY72578.33421	7	21,000	
Site C: Knock Ore Gill	C1	NY7152430975	6	745	140,489
	C2	NY71648.31007	12	77	
	C3	NY71623.31018	8	94	
	C4	NY71620.30994	56	130	
	C5	NY71502.30902	400	100,000	
	C6	NY71506.30862	16	8,800	
	C7	NY71485.30871	5	43	
	C8	NY71489.30874	20	26,000	

	C9	NY71612.30736	15	4,600	
Site D: West Knock Fell/Green Fell	D1	NY71600.30328	24	7,600	
	D2	NY71566.30292	48	700	
	D3	NY71592.30129	21	6,300	
	D4	NY71616.30040	2	37	
	D5	NY71624.30002	13	525	
	D6	NY71617.29964	170	140,000	155,162
	Site E: High Raise Band	E	NY73679.31294	<1	6
Site F: Moss Burn	F	NY74224.31656	26	3,500	3,500
Site G: Johnny's Flush	G1/G2	NY74552.31637	100	1,403	
	G3	NY74531.31608	30	5,800	7,203
Site H: Yad Moss	H1	NY77870.37523	1,500	150,000-220,000	
	H2	NY77819.37824	1	125	187,500
Site I: Sallygrain Head	I	NY79133.38691	3,800	30,000	30,000
Site J: Knock Coal Shop	J	NY73925.29788	30	55,000	55,000
Site K: Meldon Hill	K	NY76585.28505	2,000	3,700	3,700
Site L: Little Fell (northwest flanks)	L1	NY77962.22758	10	730	
	L2	NY7793522678	15	260	1,000
Site M: Little Fell (northeast flanks)	M1	NY78338.22580	30	110	
	M2	NY78415.22523	100	3,300	3,400
Site N: Connypot Beck	N1	NY80905.20294	3	76	
	N2	NY80909.20263	150	2,500	2,600
Site O: Mickle Fell	O1	NY81533.25119	15	1,200	
	O2	NY81612.25130	7	10,000	
	O3	NY81645.25134	7.5	3,600	14,800
Site P: Harthope Fell	P	NY85424.36202	<1	14	14
Site Q: Great Shunner Fell	Q1	SD84338.96977	5	3,600	
	Q2	SD84302.96998	45.5	12,000	
	Q3	SD84277.96971	229.1	30,045	
	Q4	n/a	0	0	
	Q5	n/a	n/a	64	
	Q6	SD84109.96961	n/a	present	
	Q7	SD84082.96959	n/a	present	45,709
Site R: Red Mea, Swaledale	R	NY86130.04935	n/a	542	542
Site T: Mud Beck, Arkengarthdale	T	NY95978.08508	n/a	160	160
				TOTAL	772,235

Sources:

O'Reilly, J. Date: 2016 **Confidence:** High

Roberts, F.J. Date: 2010 **Confidence:** High

Robinson, L. Date: 2012 **Confidence:** High

Population required for future maintenance of populations and diversity

The overall population of 772,235 ramets is probably stable historically and appears to be enough to maintain the population in the long term; however comments above regarding genetic exchange are pertinent.

Sources:

O'Reilly, J. Date: 2016 Confidence: High

Roberts, F.J. Date: 2010 Confidence: High

Potential for restoration of populations

Some populations where ramet numbers have declined significantly through exclosure will need to be monitored following the reintroduction of grazing (as has now occurred on all but one site) to ensure ramet numbers recover. A cyclical exclosure/grazing regime is likely to maintain the population in a healthy state enabling the build-up of ramets followed by a period with potential for sexual reproduction. The one remaining exclosed population may be in need of attention – this site (Great Shunner Fell) was exclosed for habitat/bird restoration reasons and has yet to be re-opened to grazing. Ramet number was thought to have fallen considerably here (2009) but more recent counts (2016) suggest that numbers may have previously been underestimated, although sward condition here is assessed as apparently too rank.

Three poorly understood aspects of the ecology of this species - precise hydrochemistry requirements, population genetic structure and dispersal – suggest a cautious approach is warranted towards introductions at sites in which it has not previously been found. Until greater clarity is achieved concerning these attributes it would appear sensible to refrain from introductions entirely. In this regard its Least Concern status in the England Red List, its high level of protection through SSSI/SAC coverage and the continuing discovery of existing populations should be taken into consideration (most recently in 2012 in England although two large populations have also been discovered in recent years in Scotland): this is not a threatened species in England. A re-introduction at Balderhead (on Cotherstone Moor, Co. Durham) could be considered, however, if the habitat proves recoverable. The real challenge in the long-term sustainability of *Saxifraga hirculus* in England will lie in balancing larger populations of ramets with an improved genet population.

Sources:

O'Reilly, J. Date: 2016 Confidence: High

Roberts, F.J. Date: 2010 Confidence: High

Stroh, P.A. and others. Date: 2014 Confidence: High

Favourable population

An overall population of **772,235** ramets should be sufficient for a favourable population but this will vary as exclosure to enhance flowering will depress ramet numbers and the subsequent grazing to restore ramet number will depress flowering. A favourable population will include cyclical management to allow both ramet and genet development which is likely to result in short term local decrease in population.

Comparison with situation in 1994

Dynamically stable population.

Habitat for the species

Metric
<p>Individual flush, spring or rill</p> <p>Whilst using m² as a measure would be acceptable, the habitat of <i>Saxifraga hirculus</i> is an essentially discrete entity and so “flush/rill/spring” would be better on two counts: such hydrological systems have “critical integrity” issues (it is difficult to damage part of a flush or spring without losing it entirely) and their geographical dispersal across the landscape underpins the genetic structure of the metapopulation which is likely to be of considerable significance. Populations within individual flushes may also more closely reflect the “colony” of Taylor (1987) and Roberts (2010).</p>
<p>Historic area</p> <p>42 Colonies in discrete flushes/rills/springs.</p> <p>Sources: <i>Taylor, I. Date: 1987 Confidence: High</i> <i>Roberts, F.J. Date: 2010 Confidence: High</i> <i>Robinson, L. Date: 2012 Confidence: High</i></p>
<p>Current area</p> <p>48 Colonies in discrete flushes/rills/springs.</p> <p>Sources: <i>Roberts, F.J. Date: 2010 Confidence: High</i> <i>Robinson, L. Date: 2012 Confidence: High</i> <i>O'Reilly, J. Date: 2016 Confidence: High</i></p>
<p>Area required for future maintenance of populations and diversity</p> <p>The current area is stable and acceptable for the future of this species in England. However pollen and seed vector dynamics (currently poorly understood) might require some infilling to effect gene flows. This is likely to be important for an arctic-alpine species potentially at some risk from climate change (although direct evidence of this is currently lacking).</p> <p>Source: <i>Roberts, F.J. Date: 2010</i> Confidence: <i>Moderate</i></p>
<p>Potential for habitat restoration</p> <p>Generally feasible – since lack of or excessive grazing are primary issues. There are some unoccupied flushes that potentially could be populated to facilitate gene-flows but they could have unsuitable water regimes/chemistry. It is more critical to get the appropriate management across the resource than to expand its area.</p> <p>Source: <i>Roberts, F.J. Date: 2010</i> Confidence: <i>Moderate</i></p>
<p>Favourable supporting habitat</p> <p>40+ discrete flushes/rills/springs occupied</p>

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Annex 2: Third Habitats Directive Reporting

UK context from the 3rd UK Habitats Directive report

UK conservation status:

- **Range:** Favourable
- **Population:** Favourable
- **Habitat for the species:** Favourable
- **Overall:** Favourable

UK favourable reference values:

- **Range:** 1300 km²
- **Population:** 23 localities. Localities can include a number of different colonies in reasonably close proximity. Localities are separated by larger tracts of unsuitable habitat.

Proportion of UK species within England: 78% 18/23 localities
(Now 19 out of 25 sites with the addition of Arkengarthdale and Swaledale sites).

Proportion of England species within protected sites:

- **N2K:** 84% 16/19 localities

Source: 3rd UK Habitats Directive Reporting 2013, England Submission

- **Protected areas outwith N2K:** N/A

Source: Designated sites view

European context from the 3rd Habitats Directive reports

Proportion of Atlantic biogeographic region within UK: 62.5% of the distribution

Source: European Topic Centre on Biological Diversity Article 17 species assessment for Atlantic biogeographic region.

Further information

Natural England evidence can be downloaded from our [Access to Evidence Catalogue](#). For more information about Natural England and our work see [Gov.UK](#). For any queries contact the Natural England Enquiry Service on 0300 060 3900 or e-mail enquiries@naturalengland.org.uk .

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Yellow marsh saxifrage *Saxifraga hirculus*
Peter Wakeley, Natural England