Silene gallica
Small-flowered Catchfly

PLANTLIFE

Small-flowered catchfly ***Silene gallica***
Caryophyllaceae

Status:

Nationally Scarce
93 10-km squares post 1987
Lead partner: Plantlife

Endangered
UK BAP Priority Species since 1998

UK Biodiversity Action Plan:

The following are the current targets following the 2005 Targets Review:

T1. Maintain current range of natural populations within 87 10-Km squares in the UK.

T2. Achieve a 2-fold increase in the area of habitat suitable for the natural colonisation of the species by 2010 in priority areas.

Progress on targets as reported in the UKBAP 2005 reporting round can be viewed by selecting this species and logging in as a guest on the following web site: http://www.ukbap-reporting.org.uk/

The full Action Plan for *Silene gallica* can be viewed on the following web site: http://www.ukbap.org.uk/UKPlans.aspx?ID=575

NATURAL ENGLAND

Esmée Fairbairn FOUNDATION

Cyngor Cefn Gwlad Cymru
Countryside Council for Wales

SCOTTISH NATURAL HERITAGE

Contents

1. Morphology, Identification, Taxonomy & Genetics

1.1. Morphology & Identification

A slender, upright annual plant, rarely more than 30cm tall. The stem is occasionally branched, and the whole plant is hairy. Hairs on the upper parts are glandular and sticky, hence the name 'catchfly'. The lower leaves are narrowly oval, broader near the tip than the base, while the upper leaves are narrower. Leaves are undivided and up to 5cm long. Initially, leaves are in a basal rosette, and later in opposite pairs along the stem. Flowers are borne singly with a basal bract and enclosed by a stickily-hairy calyx on the upper parts of each stem branch, often with numerous flowers on each plant. The radially symmetrical flowers are up to 15mm in diameter, with five equal white or pinkish petals. A variety (var. *quinquevulneraria*) with red-blotched petals has been cultivated asi an ornamental plant (Stace, 1994). The seed capsule is oval in shape and approximately 10mm long, splitting at the tip into six teeth. There is a mean of 48 seeds in each capsule, each weighing

approximately 0.4mg (Salisbury, 1961). They are dark brown, kidney-shaped and about 8mm in diameter.

This species could be confused with abnormally small individuals of *Silene noctiflora* or *Silene alba*. *Silene alba* does not have a glandular stem. *Silene noctiflora* flowers have deeply-notched petals, pink on the upper surface and yellow on the lower surface.

1.2. TAXONOMIC CONSIDERATIONS

None.

1.3. GENETIC IMPLICATIONS

No studies on genetic diversity within this species have been carried out. Such a study would be desirable to elucidate relationships between populations.

Fig 1. *Silene gallica*

2. Distribution & Current Status

2.1. EUROPE

Silene gallica is found in most parts of central and southern Europe.

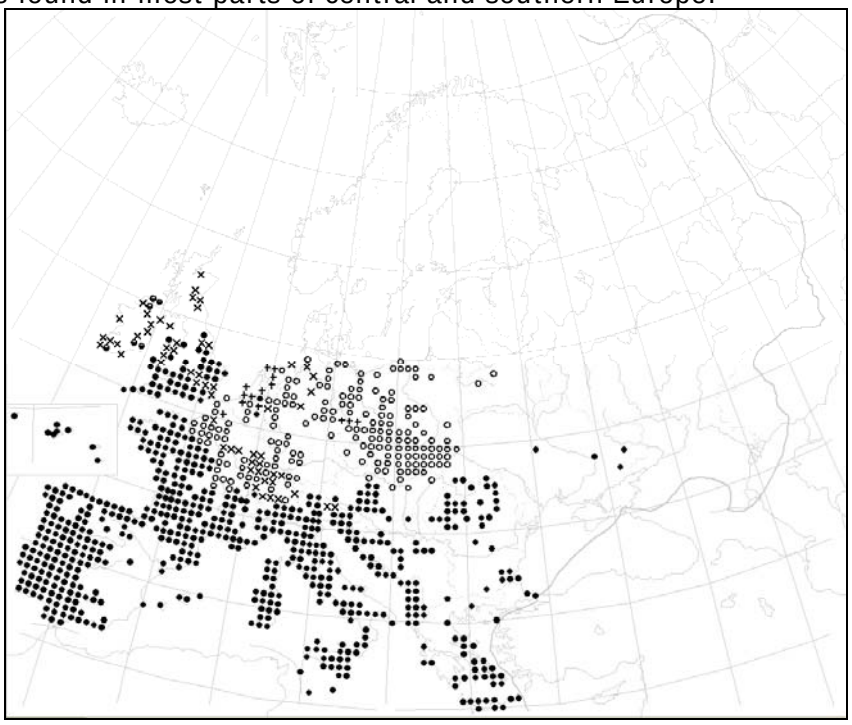


Fig 2. European distribution of *Silene gallica* (Atlas Florae Europaeae 1999 © Botanical Museum, Finnish Museum of Natural History.

2.2. UNITED KINGDOM

Overview

Silene gallica is largely a species of arable land in Britain, although it also occurs on other disturbed ground such as soft sea cliffs. It is almost entirely restricted to light, sandy, acidic soils, particularly now near the coast. *Silene gallica var quinquevulneraria* is only known as a casual of garden origin.

This species is thought to be an archaeophyte (a plant naturalized in Britain before 1500AD). Although records are widespread throughout southern Britain with isolated sites as far north as central Scotland, it has never been abundant. The majority of sites have been to the south of a line from the Humber to the Mersey Estuaries.

In the New Atlas of the British Flora, *Silene gallica* has a change index of –2.78, the 15th greatest of any species in the British flora (Preston et al., 2002). This species was included in the BSBI/Nature Conservancy Council arable plant survey (Smith 1986), but very few records were submitted. The total number of 10km squares from which it was recorded before 1970 is 382, but it was only known from 93 between 1987 and 2000. There appears therefore to have been a serious decline of this species, although as with many annuals, caution must be observed in the interpretation of these figures, as this is a species with a history of erratic appearance at many of its arable localities, and the published figures include all the sites at which it has been included as a casual and known introduction. There may be some potential for recovery from the seed-bank, but the longevity of seed is unknown.

It is a Nationally Scarce species (Stewart et al., 1994), and is included on the priority list of the UK Biodiversity Action Plan. This species is not commonly included in seed-mixes of annual species used for landscaping projects.

2.3. ENGLAND

Historically, *Silene gallica* has been recorded throughout England, although with few records in the northernmost counties, and with the majority to the south of a line from The Humber to the Severn Estuary. It was largely absent from the Midlands and the chalklands of the south and east of the country. The major concentrations of records were on the sandy soils of Norfolk and Suffolk, the acidic sands of the Hampshire Basin, The Weald and Thames Basin and on the more varied acidic soils of the south-western counties.

The 20th century saw a decline in numbers of records of this species, virtually disappearing from the north of England by 1950, and in the south with a progressive restriction to coastal regions with very few inland records. There is some evidence that seedlings of *Silene gallica* are sensitive to extremes of winter temperature (Salisbury, 1961), and this would account for its particularly rapid loss from the colder parts of the country in the face of the agricultural intensification after the Second World War.

By the end of the 20th century *Silene gallica* had become largely confined to the coastal counties of south-western England. Its survival in these areas has probably been a result of a combination of suitable climate with the persistence of relatively low-input arable farming on freely-draining sandy soils.

The county with the greatest number of sites now is Cornwall. The major stronghold of this species is Scilly, where it is still found on all of the inhabited islands. These islands have extremely mild winters and an unusual agricultural system dominated by bulb-growing for spring flowers. Other uncommon arable plants found on Scilly include *Polycarpon tetraphyllum, Fumaria occidentalis, Scandix pecten-veneris, Misopates orontium, Briza minor, Ranunculus muricatus* and *Chrysanthemum segetum*. Several other populations are known from the Cornish mainland, where management by The National Trust is helping ensure its survival. A series of small fields on the headland at West Pentire are managed for their exceptional arable flora which includes a very large population of *Silene gallica* and other species including *Fumaria occidentale, Papaver hybridum, Chrysanthemum segetum, Misopates orontium, Silene noctiflora, Petroselinum segetum* and *Legousia hybrida*.

There a number of localities in Dorset, most of which are on the Tertiary sands of the Hampshire Basin around Poole Harbour. It has also been seen recently on similar soils around the fringes of The New Forest in Hampshire and on the Isle of Wight. There is however one very unusual site on sandy soil over lias limestone at West Bexington with other uncommon species such as *Gastridium ventricosum, Anagallis foemina* and *Torilis nodosa*. *Silene gallica* occurs on low, eroding sandy cliffs near Bournemouth, probably as a relic of former arable use.

Silene gallica is still known from a very few arable sites on sandy soils near the coasts of Norfolk and Suffolk, including a large population at Snettisham near a current site for *Filago lutescens*. There are two recent sites on sandy boulder clay over chalk in Cambridgeshire, one of which has a number of other rare species including *Papaver hybridum, Silene noctiflora, Fumaria parviflora* and most exceptionally *Filago pyramidata.*

Table 1: Present & former distribution of *Silene gallica* in England by vice-county.

V-C No.	Vice-county	Total Number of extant 10km squares (Post 1987) / extinct 10km squares	% Decline	Date & Place(s) of last record
1	**West Cornwall**	12/25	68	2006, Porth Joke
2	**East Cornwall**	2/8	75	2002, Haye Farm
3	**South Devon**	1/22	95	2002, Exe Estuary
4	**North Devon**	1/6	83	1989, Melbury Hill
5	**South Somerset**	2/4	75	1992, Ilminster
6	North Somerset	0/8	100	1984, Lawrence Weston
7	**North Wiltshire**	1/4	75	1988, Sandy Lane
8	South Wiltshire	0/4	100	1950, unknown
9	**Dorset**	7/23	74	2007, West Bexington
10	**Isle of Wight**	2/8	75	1999, Cridmore Farm
11	**South Hampshire**	4/8	50	1999, Ashley
12	**North Hampshire**	1/9	89	2000, Bordon
13	West Sussex	0/9	100	1966, unknown
14	East Sussex	0/10	100	1966, unknown
15	East Kent	0/3	100	1966, Broad Oak
16	West Kent	0/4	100	1977, Hayes Common
17	Surrey	0/13	100	1980, Broomhurst Farm
18	South Essex	0/1	100	1913, Hackney Marshes

V-C No.	Vice-county	Total Number of extant 10km squares (Post 1987) / extinct 10km squares	% Decline	Date & Place(s) of last record
19	North Essex	0/8	100	1961, Berechurch Common
20	Hertfordshire	0/5	100	1950, unknown
21	Middlesex	0/4	100	1982, Barnes Common
22	Berkshire	0/10	100	1964, Tunworth
23	**Oxfordshire**	1/7	86	1997, Frilford Heath
24	Buckinghamshire	0/2	100	1965, unknown
25	**East Suffolk**	3/19	84	1998, Gorlestone, Covehithe
26	West Suffolk	0/10	100	1982, unknown
27	**East Norfolk**	2/15	93	1990, Taverham
28	**West Norfolk**	2/17	88	2001, Snettisham
29	**Cambridgeshire**	2/7	81	2002, confidential site
30	Bedfordshire	0/4	100	1970, unknown
31	Huntingdonshire	0/1	100	1926, Farcet
32	Northamptonshire	0/3	100	1955, Rothwell
33	East Gloucs	0/1	100	1920, Bourton on the Water
34	West Gloucs	0/5	100	1974, Gloucester Docks
36	**Herefordshire**	2/4	50	1988, Newport
53	South Lincolnshire	0/10	100	1965, unknown
54	**North Lincolnshire**	1/7	86	1992, Low Toynton
55	Leicestershire	0/1	100	1950, unknown
56	Nottinghamshire	0/4	100	1963, Finningley
57	Derbyshire	0/3	100	1982, Ashbourne
58	Cheshire	0/4	100	1914, Stalybridge
59	South Lancashire	0/6	100	1966, Preston
61	South-East Yorkshire	0/6	100	1940, Saxton
62	North-East Yorkshire	0/9	100	1979, New Earswick
63	South-West Yorkshire	0/5	100	1937, unknown
64	Mid-W Yorkshire	0/2	100	1888, Knaresborough
65	North-West Yorkshire	0/4	100	1950, unknown
67	South Northumberland	0/2	100	1868, Sunderland
69	Westmorland & Furness	0/2	100	1938, Windermere
70	Cumberland	0/5	100	1932, Thwaites Fell
71	Isle of Man	0/4	100	1900, unknown

2.4. WALES

Silene gallica has always been uncommon in Wales, arable land being largely restricted to the coastal lowlands of the south and west. In the past, the major areas for *Silene gallica* have been The Gower and neighbouring areas and coastal Pembrokeshire and Cardiganshire. These coastal sites are similar to those in south-western England, with relatively extensive farming and mild winters. There are two sites on a former railway line in North Wales near Colwyn Bay.

It has been recorded recently from four sites around the coast of western Pembrokeshire, at one of which, near St Ishmaels, it is seen regularly in large quantity in several places on the same farm. At an exceptional site north of Cardigan, large populations of *Silene gallica* occur in several fields on three neighbouring farms where it has been known since 1894. Also present at this site is a range of uncommon species including *Silene gallica, Scleranthus annua, Misopates orontium, Chrysanthemum segetum* and *Fumaria capreolata*. This area has been scheduled as an SSSI by The Countryside Council for Wales and has been the subject of study of management, history and ecology (Wilson, 2006).

Another very important Welsh site is on The Gower Peninsula. This farm is managed under the Tir Gofal scheme and has a large population of *Silene gallica* in one field. Also occurring here are *Valerianella rimosa, Valerianella dentata* and *Chrysanthemum segetum*.

V-C No.	Vice-county	Total Number of extant 10km squares (Post 1990) / extinct 10km squares	% Decline	Date & Place(s) of last record
35	**Monmouthshire**	1/1	0	1988, Newport
41	**Glamorganshire**	3/16	81	2004, Hunts Farm
44	Carmarthenshire	0/4	0	1960, St Clears
45	**Pembrokeshire**	3/12	74	2004, Monkhill Farm
46	**Cardiganshire**	4/5	20	2004, Ty Gwyn (Mwnt)
47	Montgomeryshire	0/1	100	1950, unknown
48	Merionethshire	0/3	100	1927, Ro Wedi
49	Caernarvonshire	0/4	100	1984, Porth Dinllaen
50	**Denbighshire**	2/3	33	2000, Pensarn
51	Flintshire	0/1	100	1924, Saltney
52	**Anglesey**	1/3	67	1988, Bodwarren Farm

2.5. NORTHERN IRELAND

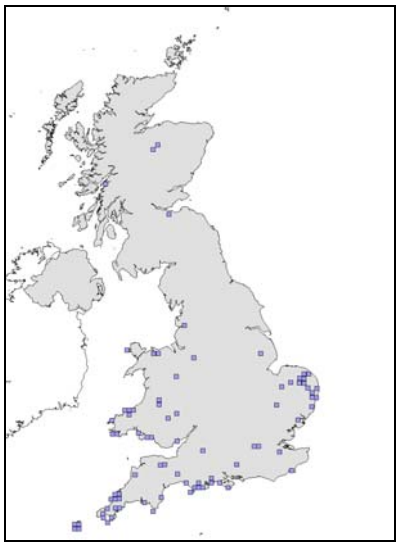
Preston et al. (2002) include nine pre-1987 10km-square records from Northern Ireland and one post 1987 record.

2.6. SCOTLAND

The majority of Scottish sites, including those recorded recently, appear to be non-persistent casuals in non-arable sites only.

V-C No.	Vice-county	Total Number of extant 10km squares (Post 1990) / extinct 10km squares	% Decline	Date & Place(s) of last record
75	Ayrshire	0/1	100	1902, Ballantrae
79	Selkirkshire	0/2	100	1963, Galashiels
80	Roxburghshire	0/2	100	1919, Melrose
82	East Lothian	0/2	100	1934, Dirleton
83	**Midlothian**	1/1	100	1989, Leith
85	Fife & Kinross	0/6	100	1963, Kircaldy
88	Mid Perthshire	0/3	100	1950, unknown
89	East Perthshire	0/1	100	1897, Limehaugh
90	Angus	0/1	100	1950, Ninewells
92	**South Aberdeenshire**	1/0		1991, Inchdryne
94	Banffshire	0/2	100	1935, Speymouth
95	Morayshire	0/1	100	1935, Forres
96	Easterness and Nairnshire	0/1	100	1935, Dyke
101	Kintyre	0/1	100	1979, Achnamara

Fig 3. Current distribution of *Silene gallica* in the UK (Preston et al., 2002).



2.7. IRELAND

There are 7 recent 10km square records from the Republic of Ireland (Preston et al., 2002).

2.8. CHANNEL ISLANDS

Preston et al. (2002) have 11 10km square records from Guernsey, Jersey and Alderney since 1987.

3. Ecology & Life Cycle

Little is known about the ecology of *Silene gallica*.

Silene gallica is an annual. Seedlings germinate both in spring and in autumn although in arable situations, plants tend to be found mainly in spring-sown crops, probably due to its inability to compete with a dense crop canopy. The length of seed dormancy in *Silene gallica* is unknown, but it is likely to be long-lived as small, regular-shaped seeds tend to be long-lived (Thompson et al., 1997).

The seeds of British species of *Silene* are small, lacking projections that would help in dispersal. They would have been easily removed from cereal seed even with the most primitive seed-cleaning technology and they have no aids to transport by animals or wind.

After germination, plants form a rosette of leaves persisting through the winter in autumn-germinating individuals. A single erect stem elongates in early to mid-summer, eventually branching in its upper parts and normally flowering from mid-June to August, but in some circumstances earlier. It is possible that autumn-germinating plants flower earlier in the year than spring-germinating plants.

In terms of established strategy (Grime et al., 1988), *Silene gallica* is probably best classified as a stress-tolerant ruderal. It is typically found in sandy soils that are poor in major nutrients, often where the crop canopy is very sparse and where there is relatively little competitive pressure.

Nothing is known about mycorrhizal associates.

Little is known about breeding systems in this species. It is likely to be at least partly self-fertile.

Nothing is known about susceptibility to herbicides, although it is likely that *Silene gallica* is susceptible to the majority of broad-spectrum herbicides.

4. Habitat Requirements

4.1. The Landscape Perspective

In arable sites, *Silene gallica* is normally found in fields cultivated in spring, although if the canopy cover is sufficiently sparse it can also occur in autumn-sown crops. It is now most frequent in fields cultivated for spring-flowering bulbs in the Scillies, and some of the best populations elsewhere are in fields where root crops are a major component of rotations.

Soils at the recently recorded sites tend to be light and sandy and in most cases acidic, although in at least two sites these sands overlie calcareous substrata.

In the intensively farmed lowlands of north-west Europe, the margins of the cultivated area of arable fields are generally the areas where the highest diversity of species are found, and where populations of uncommon species find refugia (Wilson & Aebischer, 1994). Most recently recorded sites for *Silene gallica* have been from field margins, particularly where these have been managed under agri-environment schemes. At Porth Joke, where entire fields are managed for the arable flora, *Silene gallica* can be found throughout the fields.

There are occasional casual records, but it is rare in non-arable habitats. Near Bournemouth, *Silene gallica* occurs in very open semi-natural vegetation on eroding soft-rock cliffs overlooking the Solent. There are populations on former railway lines in Norfolk and North Wales.

4.2. COMMUNITIES & VEGETATION

No detailed phytosociological analysis of British vegetation containing *Silene gallica* has been carried out.

In the National Vegetation Classification (NVC; Rodwell, 2000), OV2 (*Briza minor-Silene gallica* community) is described from the Scillies, although it is likely to occur elsewhere along the western coasts of England and Wales. This community is thought to be characteristic of sandy soils in areas of extreme oceanic climate (high rainfall and mild winters), and in the unusual agricultural conditions of the Scilly bulbfields, *Silene gallica* and other species are able to flower and seed very early in the year. The related OV6 (*Cerastium glomeratum-Fumaria muralis* community) is also characteristic of the extreme south-west of Britain and is a locus for *Silene gallica, Briza minor* and uncommon *Fumaria* species. Further east in the country, for instance in the Hampshire Basin, *Silene gallica* is probably found mainly in OV4 (*Chrysanthemum segetum-Spergula arvensis* community). Vegetation at east coast sites in Norfolk and Suffolk is likely to be OV1 (*Viola arvensis-Aphanes microcarpa*), while at one of the Cambridgeshire sites on sand over chalk the vegetation appears to closest to OV15b (*Anagallis arvensis-Veronica persica* community, *Legousia hybrida-Chaenorhinum minus* sub-community).

Many sites for *Silene gallica* have species-rich vegetation with several other uncommon species. Information on rare species is available from six sites. Of these rare species *Chrysanthemum segetum* and *Misopates orontium* are the most frequent. The occurrence of the UKBAP priority list species *Valerianella rimosa* at Cridmore Farm (seen once only) and at Hunt's Farm (abundant) and *Filago pyramidata* at the confidential Cambridge site is particularly noteworthy. *Centaurea cyanus* also occurs at Cridmore Farm but not in the field where *Silene gallica* has been seen.

Table 2: Rare species recorded in association with *Silene gallica* at six sites.

Species	Scilly	Porth Joke	Cridmore Farm	Cambridge	Hunt's Farm	Mwnt
Briza minor	*					
Chrysanthemum segetum	*	*	*		*	*
Filago pyramidata				*		
Fumaria bastardii	*				*	*
Fumaria capreolata	*					*
Fumaria occidentalis	*	*				
Fumaria parviflora				*		

Species	Scilly	Porth Joke	Cridmore Farm	Cambridge	Hunt's Farm	Mwnt
Legousia hybrida		*		*		
Misopates orontium	*	*			*	*
Papaver hybridum		*		*		
Petroselinum segetum		*	*			
Polycarpon tetraphyllum	*					
Ranunculus muricatus						
Scandix pecten-veneris	*					
Scleranthus annuus						*
Silene noctiflora		*		*		
Valerianella dentata			*			
Valerianella rimosa			*		*	

4.3. Summary of Habitat Requirements

Habitat features important to *Silene gallica* across Britain are summarised in Table 3.

Table 3: Habitat features important to *Silene gallica* in Britain.

Type	
Physical & topographical	A lowland species. Soils are freely draining sands, in most cases acidic, but also overlying limestone. Sites are generally unshaded, flat or gently sloping to the south. At non-arable sites, occurs on semi-stabilised, very freely draining and nutrient-poor substrata with skeletal soils.
Vegetation/structural	*Silene gallica* is a poor competitor. When growing with a crop it cannot tolerate a dense, closed canopy. Vegetation is generally species-rich with much exposed soil remaining throughout the growing season.
Processes	*Silene gallica* needs exposed soil for germination. In arable sites this disturbance is created by ploughing. In non-arable sites sufficient disturbance is created by movement of the unstable substrata and the activities of rabbits.
Chemical	Soils are naturally deficient in macronutrients. Large quantities of nitrogen, phosphorus and potassium are

Type	
	typically added annually to arable soils, but *Silene gallica* is likely to be found only where fertiliser applications are deficient such as at field margins on naturally infertile soils.

Silene gallica has many features in common with other rare annual species of arable land. Some of these are also included in Plantlife's *Back from the Brink Programme* and are listed on the Priority List of the UK Biodiversity Action Plan (http://www.ukbap.org.uk/bapgrouppage.aspx?id=112). These include *Galium tricornutum, Valerianella rimosa, Torilis arvensis* and *Scandix pecten-veneris*.

It is a short-lived species that has relatively simple requirements. It needs to produce seed regularly and requires large gaps in the vegetation for seedling establishment. It appears to have a long-lived seed-bank which confers an ability to survive periods of adverse conditions. It is a poor competitor and is favoured by an open crop canopy and relatively sparse vegetation. It is likely to be highly susceptible to the majority of broad-spectrum herbicides.

5. Management Implications

Suitable management of arable land for *Silene gallica* involves annual cultivation, ideally in mid-autumn or early spring without subsequent disturbance until the following autumn. No fertiliser or herbicide should be applied, although it may be necessary to take measures to reduce the quantity of competitive weeds such as thistles, sow-thistles and grasses by controlled herbicide use.

6. Threats/ Factors leading to loss or decline or limiting recovery

The major reason for the loss of populations in arable land has been the progressive intensification of farming since the early 20th century. After the Second World War populations were lost with the introduction of more competitive crop varieties, increasing applications of nitrogen, the development of effective broad-spectrum herbicides and the earlier cultivation and drilling of crops in the autumn. These processes continue to threaten the few remaining sites.

New threats come from the abandonment of arable land as the profitability of arable farming in Britain decreases, although current rises in cereal prices have meant that this may be less of a threat in the near future. The first parts of fields to be withdrawn from production are usually the less productive field margins which are also the last refugia of many rare arable plants. These are often converted to grassland, sometimes as part of agri-environment schemes designed to benefit farmland wildlife. It is important that the management of field margins under agri-environment schemes is considered in the context of the available information on distribution of uncommon arable plants.

Bulbfields on Scilly are at risk from changes in the economics of production and transport of cut flowers.

Non-arable sites are at risk from successional processes. These involve the development of closed grassland communities and scrub. Coastal sites may be vulnerable to cliff erosion.

Table 4: Threats to the survival of *Silene gallica* in the UK.

Type	Threat
Habitat destruction	Agricultural improvement: high levels of nitrogen application, use of broad-spectrum herbicides, early autumn cultivation and crop drilling.
Successional	The development of closed grassland following cessation of ploughing. Field margins can be taken out of production both as part of changes in farming operations and also as part of agri-environment schemes. Development of closed grassland and scrub on cliff tops and in quarries.
Erosion	Disappearance of maritime cliffs as a result of erosion which may increase with climatic change and rising sea-levels.

7. Current Conservation Measures

7.1. In-Situ Measures For Formal Protection

The only site known to be included within an SSSI is Mwnt Arable Fields near Cardigan in Ceredigion. This includes a remarkable series of fields forming part of three farms adjacent to the coast. There are large populations of *Silene gallica* and several other notable species.

Several other sites are being managed under Countryside Stewardship (England) or Tir Gofal (Wales) agreements. These include Hunt's Farm (Glamorgan) and Cridmore Farm (Isle of Wight). Porth Joke is owned by The National Trust, and in addition to having a Countryside Stewardship agreement, it is managed for its arable flora.

It should be emphasised that grant-aid schemes for conservation land management are liable to change in the long-term, and there is no guarantee that schemes currently in place will receive funding in the future.

The major countryside conservation programmes in England offering assistance to land managers conserving sites currently or formerly supporting populations of *Silene gallica* are Entry Level Stewardship and Higher Level Stewardship. These have replaced the Countryside Stewardship and Environmentally Sensitive Area schemes. In Wales, the corresponding scheme is Tir Gofal.

These agri-environment schemes offer farmers 5- or 10-year agreements to manage land in an environmentally sensitive manner in return for annual payments. Options for the management of field margins for arable flora are available under these schemes. These are administered by Natural England and Countryside Council for Wales.

For more information about each programme access the appropriate link by clicking on the scheme title. The administration and availability of these schemes is under constant review.

7.2. *EX-SITU* MEASURES

Collections of seed of *Silene gallica* from West Pentire in Cornwall, Wrabness Railway Station in Essex, a Pembrokeshire site and Isles of Scilly site are held in the Millennium Seed Bank at The Royal Botanical Gardens at Wakehurst Place.

7.3. RESEARCH DATA

No research data is available.

7.4. MONITORING *SILENE GALLICA* AND THE COMMON MONITORING STANDARD

Individual flowering plants of *Silene gallica* are relatively easy to distinguish and count. At some sites numbers are small and all individuals should be counted. At other sites where numbers are large an alternative strategy should be considered that includes mapping the area covered by the population and an estimate of population size.

8. References

Biodiversity Steering Group (1995). *Biodiversity: the U.K. Steering Group report*. H.M.S.O., London.

Clapham A.R., Tutin T.G. & Moore D.M. (1987). *Flora of the British Isles*. Cambridge University Press.

Grime J.P., Hodgson J.G. & Hunt R. (1988). *Comparative Plant Ecology*. Chapman & Hall, London.

Perring F.H. & Walters S.M. (1982). *Atlas of the British Flora, 3rd Edition*. EP Publications, Wakefield.

Preston, C.D., Pearman, D.A. & Dines, T.D. (2002). *New Atlas of the British & Irish Flora*. University Press, Oxford.

Rodwell J.S. (2000). *British Plant Communities Volume 5. Maritime Communities and Vegetation of Open Habitats*. Cambridge University Press.

Salisbury E. (1961). *Weeds and Aliens*. Collins, London.

Smith A. (1986). *Endangered Species of Disturbed Habitats.* NCC, Peterborough.

Stace, C.A. (1997). *New Flora of the British Isles (2nd ed.)*. University Press, Cambridge.

Stewart A., Pearman D.A. & Preston C.D. (1994). *Scarce Plants in Britain*. JNCC, Peterborough.

Wilson P.J. (1990). *The Ecology and Conservation of Rare Arable Weed Species and Communities*. PhD Thesis, Southampton.

Wilson P.J. (1999). The effect of nitrogen on populations of rare arable plants in Britain. *Aspects of Applied Biology*, **54**, 93-100

Wilson P.J. (2004). Important Arable Plant Areas: A Review of the Status of Nationally Rare Vascular Plant Species Identified by the Draft IAPA Criteria. Plantlife, Salisbury.

Wilson P.J. & Aebischer N.J. (1994). The distribution of arable weed seed banks in relation to distance from the field edge. *Journal of Applied Ecology*, **32,** 295-310.

9. Contacts

Plantlife International	or contact enquiries:

The Wild Plant Conservation Charity 14 Rollestone Street Salisbury Wiltshire SP1 1DX Tel: 01722 342730	enquiries@plantlife.org.uk

10. Acknowledgments

Plantlife International wishes to acknowledge the financial support of Natural England, Scottish Natural Heritage and the Countryside Council for Wales for the *Back from the Brink* (species recovery) programme and the Esmée Fairbairn Foundation for the *Arable Plants Project*.

11. Links

- ARKive species web page for *Silene gallica:*
http://www.arkive.org/species/ARK/plants_and_algae/Silene_gallica/

- Plantlife Species Briefing Sheet for *Silene gallica*

Phil Wilson
First draft dated January 2008
Edited by Plantlife March 2008