

## *Silene conica* L.

### Sand Catchfly

*Silene conica* is a glandular-hairy plant with rose-pink petals notched at the tip and an urn-shaped calyx with distinctive raised veins. It is associated with open, infertile, alkaline or weakly acid soils, and is found in dry sandy grassland, sandy shingle, arable field margins, tracksides, commons and waste ground. In Britain, the species has its stronghold in the East Anglian Brecks. Elsewhere, it is rare and very thinly scattered across southern England, very rare in Wales, and now absent from Scotland. It is assessed as Vulnerable in GB, but has recently been assessed as Endangered in England due to a decline of >50%.



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#### IDENTIFICATION

*Silene conica* has ascending to erect, glandular hairy grey-green solid stems (10-35(50) cm) that often only bear a single inflorescence (Poland & Clement 2009) but exceptionally can have up to 10 flowers per plant (Jonsell 2001). The grey-green (sometimes purplish) urn-shaped calyx (10-18 mm) also has sticky-glandular hairs and c. 30 distinct raised veins, long acuminate teeth (6-8 mm) and is inflated and strongly ovoid at fruiting (Stace 2010).

Flowers are 4-5 mm across with rose-pink to violet-red petals that have a pronounced notch at the apex. Plants have an ephemeral rosette of linear to spatulate basal leaves and 3-4 pairs of unstalked linear-lanceolate downy stem leaves that are acuminate and often widened towards the base (Jonsell 2001)



*Silene conica* at Sandwich golf club, east Kent. ©Malcolm Storey 2004.

#### SIMILAR SPECIES

When in flower or fruit, the calyx features noted above quickly separate *S. conica* from other *Silene* species in Britain. *S. conica* occurs in similar habitats throughout the western Mediterranean but is a much taller plant that has larger inflated calyces (22-28 mm) that are narrowed to a long apex and wider, less densely hairy leaves (Polunin 1969).

#### HABITATS

*S. conica* is a species of open dry sandy grassland and heaths over unproductive alkaline or weakly acid soils. In Britain, it is associated with fixed sand dune vegetation (e.g. Rhind & Jones 1999), sandy shingle, open pastures, arable fields, old pits, tracksides, commons and waste ground (Lusby 2002; Sanford & Fisk 2010).

Preston et al. (2013) assign the species to the *Medicago sativa* biogeographical cluster that contains many Breckland rarities, and in Rodwell (1992), *S. conica* is a rare associate of NVC CG7 *Festuca ovina* - *Hieracium pilosella* - *Thymus praecox/pulegioides* grassland as well as the *Erodium-Teesdalia* sub-community of U1 *Festuca ovina*-*Agrostis capillaris*-*Rumex acetosella* alongside Breck specialities such as *Medicago sativa* subsp. *falcata*, *Phleum phleoides*, *S. otites* and *Veronica verna*.

Across its Eurasian native range it is a characteristic plant of the *Koelerion glaucae* and the *Sedo-Sclerenthetae* (Watt 1971), with early stages of vegetation communities dominated by acrocarpic bryophytes (e.g. *Tortula* spp.) and small winter annuals of low competitive ability.

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### BIOGEOGRAPHY

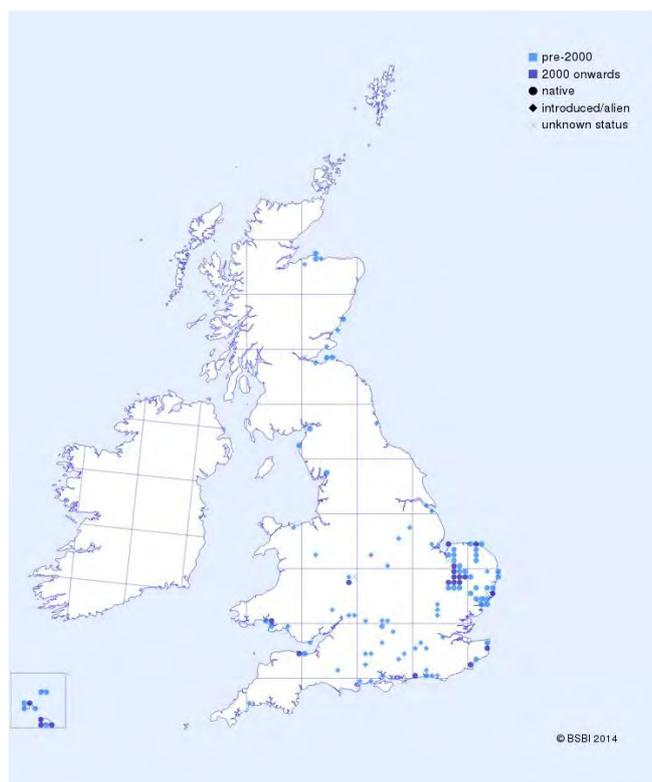
*S. conica* has a Eurosiberian Southern-Temperate floristic element (Preston & Hill 1997) and is found throughout south-western and central Europe, as well as North Africa and south-west Asia (Briggs 1994). It is known to be widely naturalised outside of its native range e.g. Denmark, Sweden, North America, New Zealand and Australia.

In Britain *S. conica* has its stronghold in the Brecklands of East Anglia. It has a very thinly scattered distribution across other parts of southern England and south Wales, although the native/alien status of these populations is complex, and it may be that all locations outside of East Anglia are alien records (Stace 2010).

Based on the assigning of status in the New Atlas and using up to date distribution data, *S. conica* is currently known from one native Welsh location at Pembury Burrows, and in England the species is extant in eight vice-counties with the majority of sites having <30 plants. It is extinct as a native plant in Scotland, having previously been present in scattered coastal locations from East Lothian to Moray. It has not been recorded from Ireland.

### ECOLOGY

*S. conica* is annual species of dry, unproductive alkaline or weakly acid soils, flowering between May and mid-June. It behaves as a winter annual, with seeds (<0.4 mm diameter) germinating in late summer and cotyledons overwintering before producing a second pair of foliage leaves in the late



Distribution of *Silene conica* in Great Britain and Ireland.

winter months. A high mortality of seedlings has been observed following germination (Salisbury 1930), although mortality appears to be largely confined to the seedling stage.

Each individual plant is capable of producing large numbers of seeds e.g.  $5335 \pm 848$  (Wessels-de Wit & Schwabe 2010) with a hot dry early summer thought to be important for seed ripening (Salisbury 1930).

The seeds of *S. conica* are likely to be dispersed via wind (anemochory), and seed has been found in the hair of wild boar (Couvreur et al. 2004) despite the lack of a specialised adhesive appendage. Couvreur et al. (2004) hypothesize that animals with thick hair at low densities are better suited to trapping and retaining small seeds, whereas animals with dense fur seem to be more adapted to retaining seeds that have specialized appendages (e.g. barbed hooks). Field experiments by Eichberg et al. (2006) have also shown that viable *S. conica* seed can survive internal (endozoochorous) dispersal by sheep, with field experiments recording germination from droppings and the subsequent production of viable offspring.

*S. conica* favours climatic conditions consisting of low rainfall and a potential for a deficit of water in the spring, high summer temperatures and winters that are comparatively dry and cold with little snowfall but with frequent and late frosts (Rodwell 1992). Plants have a low competitive ability and persist in bare patches or where the turf is short and open (Watt 1971; Hill et al. 2004).

Eichberg et al. (2006) demonstrated that *S. conica* benefitted from soil disturbance when the ground layer comprised a high percentage cover of perennial pleurocarpous mosses (e.g. *Hypnum cupressiforme* var. *lacunosum*) that have extensive lateral branching and build up layers over time. However, *S. conica* was inhibited by disturbance in pioneer stages of vegetation development when acrocarpous mosses such as *Tortula* spp. were prevalent. Acrocarps are often tufted and can be annual or perennial, and it is possible that the presence of such mosses create a microclimate that benefits *S. conica* plants.

### THREATS

Vegetation succession, the stabilisation of soils and continued landscape fragmentation are the main threats to extant populations. Such threats are linked to a variety of factors including the cessation of traditional grazing regimes, more intensive agricultural practices, the planting of forestry, and nutrient enrichment of soils that prevent the annual breakdown of organic material and lead to a gradual accumulation of soil subsequently colonised by perennials (Tim Pankhurst pers. comm.). Long-term changes to historical weather patterns also may affect flowering and fruiting performance.

### MANAGEMENT

Suitable management should follow traditional grazing practices using sheep (and rabbits) to produce a tightly grazed

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sward by the end of the growing season. Rabbit grazing will also generate periodic small-scale disturbance of the soil to the benefit of *S. conica*. At a landscape scale, the restoration of natural processes such as wind-blow in the Brecks is possible via the strategic removal of sections of conifer plantation, and at coastal locations management should allow for the natural mobility of dune systems through the provision of larger areas of land and reserve boundaries. The targeted inclusion of a 'fallow field' prescription within agri-environment schemes would also help to conserve and expand the range of several rare Breckland species, including *S. conica*.

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### AUTHOR VERSION

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### SUGGESTED CITATION

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