

Saxifraga granulata L.

Meadow Saxifrage

Saxifraga granulata has kidney-shaped leaves, red bulbils at the base of the plant, and white flowers with petals much longer than the calyx. It is associated with damp but well-drained base-rich to neutral unimproved soils, and is found in a variety of grassland habitats including pastures, hay meadows, road-side verges, churchyards, and flood meadows. It is widespread across England, southern and eastern Scotland and southern Wales, rare in Ireland, and largely absent from western and north-west Scotland and south-west England. *S. granulata* is assessed as of Least Concern in GB, although a decline of 11% has been detected in England.



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IDENTIFICATION

An elegant member of the Saxifrage family most readily identified by the tiny (3-5 mm) spherical pink or red axillary **bulbils** (sometimes referred to as ‘granulations’) found either in the lowest leaves or on the short rhizome.

S. granulata has dark-green, sparsely-hairy, kidney-shaped, 5-7(-13)-lobed basal leaves that are cordate at the base and held on long (up to 50 mm) petioles (Fay et al. 2009; Poland & Clement 2009; Stace 2010). Flowering stems are 15-30(-50) cm tall, and hold 5-petaled white protandrous flowers with petals 3-4 times as long as the calyx (Stevens & Richards 1988). Stem leaves become narrower and more shortly stalked as they progress up the stem, and the flowering stems, sepals and petioles are often all glandular hairy.



Leaves of *Saxifraga granulata* at Pwll y Wrach nature reserve, Pembrokeshire. ©John Crellin.

SIMILAR SPECIES

The presence of bulbils at the base of the plant separates *S. granulata* from all other Saxifrages in Britain and Ireland apart from the very rare *S. rivularis*, and this species is only present above 900 m in central and northern Scotland (Stace 2010).

HABITATS

A plant of base-rich or neutral, damp but well-drained soils, associated with unimproved grassland in a variety of habitats, including lightly-grazed pastures, downland, flood meadows, hay meadows, road-side verges, hedgebanks, and churchyards where it is sometimes an introduction. It is also found on shady river banks and in damp woodland (Gornall 2002) and more rarely on basic rocks by streams or waterfalls (Chater 2010).

S. granulata is associated with NVC MG3 *Anthoxanthum odoratum*-*Geranium sylvaticum* grassland (Rodwell 1992), and has also been recorded from vegetation equating to a number of MG and CG types, including MG4 *Alopecurus pratensis*-*Sanguisorba officinalis* grassland, MG5 *Cynosurus cristatus*-*Centaurea nigra* grassland and habitats that have affinities to CG3 *Bromus erectus* grassland.

Across its European range, *S. granulata* is also a common associate of dry siliceous grassland on sandy terraces of river valleys, growing in *Poa angustifolia*-dominated habitat with *Dianthus deltooides*, *Veronica spicata*, *Sedum telephium*, and *Pimpinella saxifraga*.

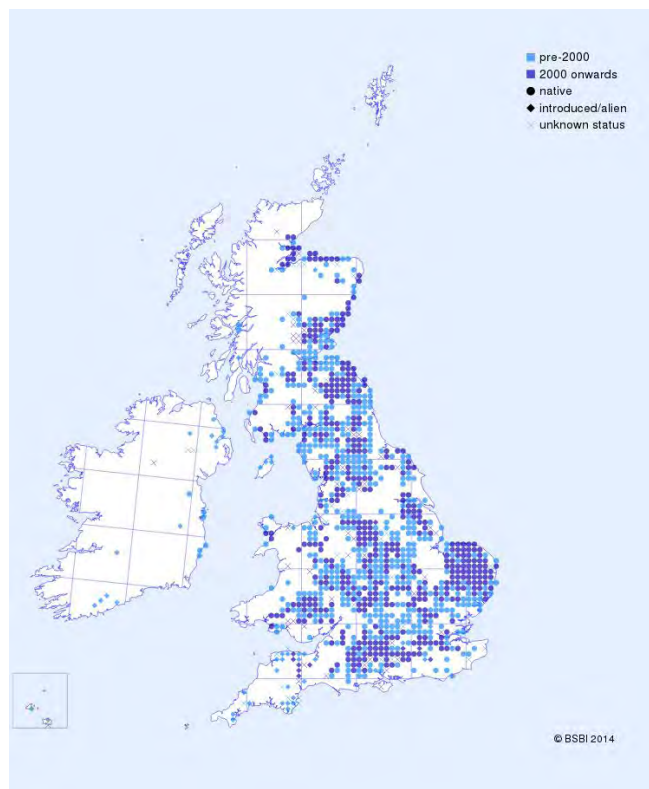
Saxifraga granulata L.

BIOGEOGRAPHY

S. granulata reaches its global north-western range limit in Britain where it is widespread across England, southern and eastern Scotland and southern counties of Wales. Elsewhere it is widespread but more thinly scattered, with notable declines in recent years from southern England. *S. granulata* is a rare species in north and west Wales and western Scotland and absent from north-west Scotland. In Ireland it may now only be present as a native species at three sites in or close to County Dublin.

In south-west England all extant populations are thought to be naturalised (Gornall 2002), although two fossilised seeds found in the Alleröd layer at Hawks Tor, Cornwall, were tentatively referred to as *S. granulata* by Godwin (1956; Fay et al. 2009), suggesting that it may once have been native to this area. *S. granulata* is predominantly a lowland (<300 m) species in Britain and Ireland, but can be found at higher altitudes and up to 580 m in Westmoreland.

It is widespread throughout northern, western and central Europe but is considered threatened in many areas within this range. It reaches its southern range limit in north-western Africa and its absolute northern limit in Finland and Sweden. It is replaced in south-east Europe by *S. graeca* and in the western Mediterranean by *S. corsica* (Stevens & Richards 1985). *S. granulata* is encountered as a naturalised garden-escape across its range, often as the double-flowered (*flora pleno*) form.



Distribution of *Saxifraga granulata* in Great Britain and Ireland.

ECOLOGY

A perennial winter-green hemicryptophyte of damp, well-drained neutral or basic soils, producing fragrant flowers from April to June. The inflorescence is a lax, 3–10-flowered corymb. Flowers are self-compatible, protandrous and populations can be gynodioecious, with female plants having smaller petals than hermaphrodite plants (Stevens & Richards 1988; Andersson 1995).

Flowers are pollinated by at least 27 different insect species (Lindgaard Hansen & Molau. 1994) including dagger flies, hoverflies and solitary bees. Seeds are small (0.5 x 0.3 mm), light brown and have papillae in longitudinal rows. Seed production is generally low in British gynodioecious populations, but recent studies in Denmark have found high seed set in hermaphrodite populations (Lindgaard Hansen & Molau 1994). However, the main means of reproduction is vegetative via axillary bulbils, with seedling survival found to be negligible in field studies undertaken by Richards (1986).

Following flowering in the spring and plant senescence in the summer months, the axillary bulbils persist and go on to develop a new basal rosette in the autumn which then over-winters and produces flowers either the following spring or after one complete growing season. It is probable that bulbils are dispersed across suitable habitat by adhering to the muddy feet of livestock, and bulbils can survive long-distance dispersal as demonstrated by the presence of *S. granulata* as an associate of 'ballast flora' in Finland (Hæggström et al. 2012).

THREATS

The main threat to extant populations is loss of habitat through conversion to arable farming, urban and coastal development or 'improvement' after the use of broad-spectrum herbicide. Plants prefer open, light conditions on unimproved soils and although they can persist for a short period of time in ranker grassland, cessation of cutting or grazing regimes will eventually shade out plants.

MANAGEMENT

Management of extant populations should follow a traditional cutting or grazing regime that results in a short sward by the end of the growing season.

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Saxifraga granulata L.

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