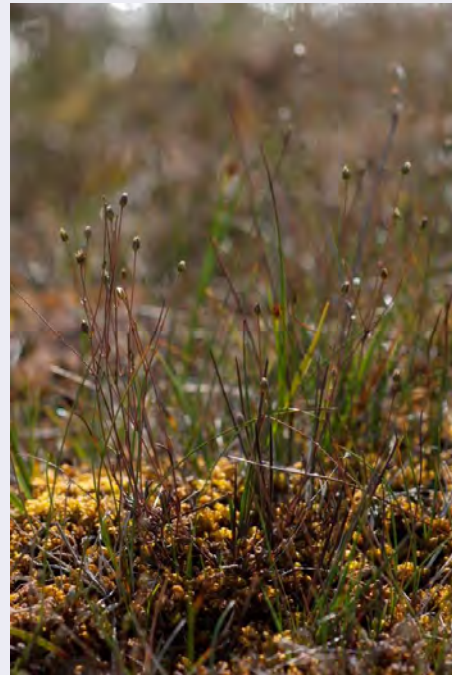


## *Minuartia stricta* (Sw.) Hiern.

### Teesdale Sandwort

*Minuartia stricta* is a delicate, tufted plant with narrow, opposite one-veined leaves and flowers with white petals that slightly exceed the sepals. In Britain it is known only from Widdybank Fell in Upper Teesdale, where it is confined to open, gravelly flushes and the very fragile margins of streamsides on metamorphic sugar limestone, growing on bare tufa or around the base of hummocky mosses. It is currently known from about six localities, although recent surveys suggest a c.50% decline in the population since the late 1990s, leading to an assessment of Endangered in England.



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#### IDENTIFICATION

*Minuartia stricta* is a tufted but very delicate, erect short-lived perennial to 10 cm. The stems are slightly woody below, with narrow one-veined leaves held distantly in opposite pairs. The flowers are small (less than 8 mm across) with the sepals slightly exceeding the white petals. The flowering stems are very sparse with usually one but up to three flowers.

#### SIMILAR SPECIES

*Minuartia stricta* is easily told from *M. verna* by its smaller flowers, single- not three-veined leaves and glabrous pedicels (not glandular hairy). *Sagina nodosa*, with which it sometimes grows, has 4-5 styles and capsule teeth whereas *M. stricta* usually has 3.



Base-rich flush habitat in Upper Teesdale, one of the few locations in Britain for *Minuartia stricta*. ©Jeremy Roberts.

#### HABITATS

*Minuartia stricta* is confined to open, gravelly flushes and eroding margins of streamsides (sikes) on metamorphic sugar limestone on Widdybank Fell in Teesdale. It is one of the classic Teesdale rarities discovered by George Gibson and James Backhouse Jr. in 1844 (Backhouse 1884; Graham 1998). It has since been found in about six localities, although some of the largest colonies were destroyed during the construction of Cow Green Reservoir.

It is not a strong competitor and usually grows on bare tufa or around the base of hummocks of the mosses *Catocopium nigratum* and *Hymenostylium recurvirostrum* (Pigott 1956; Wigginton 1999) within NVC M10c *Festuca rubra-Plantago* spp. maritime grassland, *Schoenus nigricans* sub-community vegetation, a sub-community that is unique to Teesdale (Rodwell 1991). Very occasionally it also colonises bare rock, gravel or more closed communities, but rarely persists (Bradshaw 1985).

#### BIOGEOGRAPHY

*Minuartia stricta* is a circumpolar species occurring in arctic and sub-arctic Europe, primarily in Norway, the Urals and mountains of Central Asia. It also occurs in Sweden, Finland, Iceland, Svalbard, Greenland and arctic North America. It was assumed to be extinct in Central Europe (Jura Mountains, southwest Germany) but has recently been rediscovered in Germany (Buchholz & Welk 2005).

In Britain it is only known from between 490 to 510 m on **Widdybank Fell, Upper Teesdale**. Populations south of 45°N in North America (Colorado, California) and 55°N in Europe (Teesdale, Jura, Germany) are likely to be relicts of a much wider post-glacial distribution (Pigott & Walters 1954; Pigott

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1956).

### ECOLOGY

*Minuartia stricta* is sometimes perennial, though may often behave as an annual in Britain, with numbers fluctuating from year to year, presumably depending on the success of germination and survival of seedlings (Wigginton 1999).

Flowering takes place in June and July, although individual flowers only last for a few days (Marren 1999). The flowers are usually closed at anthesis and only open in sunny, warm conditions, suggesting that it is largely self-fertilising (Jonsell 2001). However, it produces nectar and pollen that presumably attract insects (e.g. thrips, flies, etc.) that are also found on *M. verna*.

It is spread mainly by seeds as well as by short, basal rooting shoots; the seeds can remain viable for at least five years in the soil (Pigott 1956).  $2n = 22, 30$ .

### THREATS

Possibly the most immediate threat to *M. stricta* is trampling by botanists which could rapidly degrade its very fragile habitat. However, more severe spring droughts due to climate change may present a more direct threat in the future.

Sporadic counts have shown a gradual decline in numbers since the mid-1980s with an average of 360 between 1984 and

1994 and 173 between 2012 and 2013, though individual colonies fluctuated quite markedly, even doubling in size over a three year period (Wigginton 1999).

### MANAGEMENT

Management should ensure that the fragile habitat where *M. stricta* occurs is protected from trampling by visiting botanists, and that grazing pressure does not result in the degradation of existing populations.

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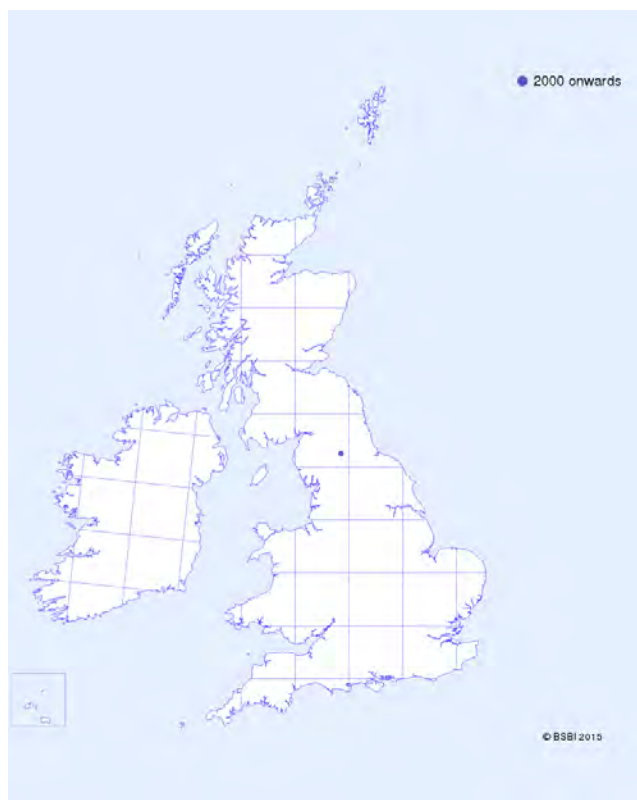
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### AUTHOR VERSION

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### SUGGESTED CITATION

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Distribution of *Minuartia stricta* in Great Britain and Ireland.