

## *Bartsia alpina* L.

### Alpine Bartsia

*Bartsia alpina* has opposite, sessile leaves and dark-purple tubular flowers. It occurs in damp base-rich soils and has a fragmented and restricted distribution in Britain, occurring in Perthshire and Argyll in Scotland, and in mid-west Yorkshire, County Durham and Westmorland in England. In Scotland, it is mainly associated with damp, herb-rich ledges comprising calcareous-schist, whilst in England it is found on the drier hummocks of base-rich flushes and marshes, in damp meadows and pastures, and on unstable flushed river-side slopes. It is assessed as of Least Concern in Britain but as Vulnerable in England due to a small and restricted population size.



©Pete Stroh

#### IDENTIFICATION

A tufted, hemi-parasitic perennial with erect or ascending glandular hairy stems up to 40 cm tall. The sessile leaves (10–25 x 6–15 mm) are opposite, glabrous above, pilose to hirsute below, and characteristically rugose on the upper side with crenate margins.

The calyx (6–10 mm) often has glandular violet hairs and is exceeded in length by dark-purple bracts. *B. alpina* flowers comprise violet or deep-purple cylindrical tubes (15–20 mm) with a 2-lipped limb, the upper of which is longer than the lower (Taylor & Rumsey, 2003).



Cetry Bank, Teesdale, famed for its species-rich turf which includes *Bartsia alpina*. ©Kevin Walker.

#### SIMILAR SPECIES

When in flower *B. alpina* is unlikely to be confused with any other species. Small vegetative shoots, however, may resemble seedlings of other members of the Scrophulariaceae, especially *Euphrasia* spp. and *Rhinanthus minor*, with which it often occurs.

#### HABITATS

In Britain *B. alpina* occurs in Scotland and England but within very different habitats. In Scotland it is almost entirely restricted to unimproved herb-rich swards on the damp, periodically-inundated ledges of crags comprising calcareous-schist, and in the recent past (last record 1968) from base-rich meadows at the foot of Ben Lawers. In England, it occurs on the drier hummocks within base-rich flushes and marshes, in damp meadows and pastures and on unstable, flushed slopes eroded by rivers or streams (Taylor & Rumsey, 2003; see photo opposite).

In Scotland, *B. alpina* is a scarce associate of the NVC CG14 *Dryas octopetala*-*Silene acaulis* ledge community, and more rarely, with U17 *Luzula sylvatica*-*Geum rivale* tall-herb community and an NVC type which shares close affinities with CG11 *Festuca ovina*-*Agrostis capillaris*-*Alchemilla alpina* grass heath. In England it is found in M10 *Carex dioica*-*Pinguicula vulgaris* mire. In both England and Scotland, *B. alpina* has a very similar distribution to that of another rare plant with a disjunct distribution, *Kobresia simpliciuscula*, and in Scotland *B. alpina* can also be found growing above steeper and drier micaceous slopes that provide a specific niche for *Juncus castaneus*.

## *Bartsia alpina* L.

Across Eurasia it is also associated with alpine meadows, alpine and subalpine calcareous small sedge fens, areas where there is long-lasting snow cover, and in forest mires with only very slight base enrichment (Wigginton & Rothero, 1999).

### BIOGEOGRAPHY

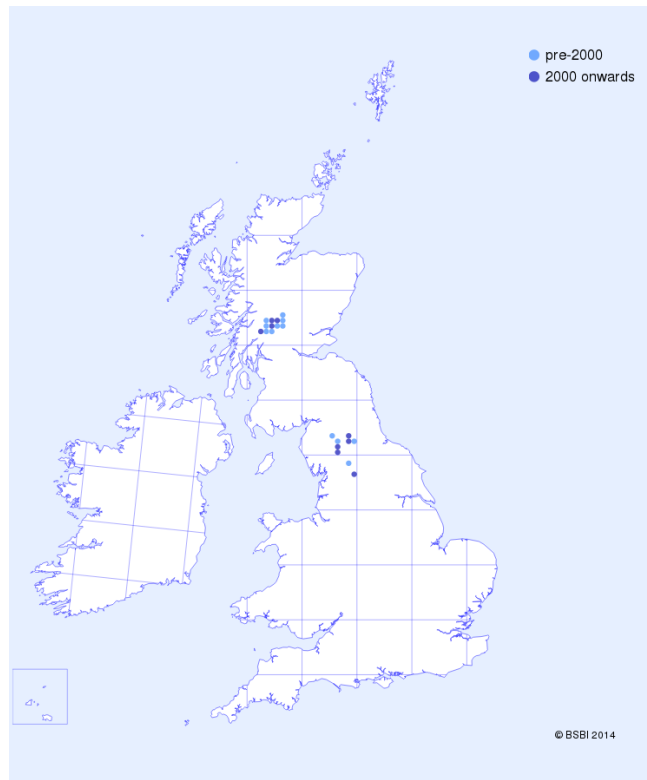
*Bartsia alpina* is known from Greenland, Canada (around Hudson Bay), Iceland, the Faeroe Islands, Scandinavia, and eastwards to the Urals. It is present in alpine areas throughout Europe, reaching 3,000 metres in the Alps.

It was first recorded in Britain by John Ray at Orton Pastures (Westmorland) in 1668 during a tour of Yorkshire and Westmorland. Since then it has been found in half a dozen or so localities in northern England (Mid-west Yorkshire, Co. Durham, Westmorland), where it remains extremely rare, and around 25 in Scotland (Perthshire, Argyll). Many of the English populations are very small, whereas the two largest Scottish populations comprise some 2,000–3,000 plants.

The species has a western distribution in England and Scotland, even though there are numerous places to the east in Angus where all of its habitat requirements appear to be met (Raven & Walters, 1956). Populations range in altitude from 245 metres near Orton (Cumbria) to 950 metres in Scotland, with most sites being between 600 and 800 metres.

### ECOLOGY

*Bartsia alpina* is a perennial hemi-parasite, flowering between June and August and propagating mainly by



Distribution of *Bartsia alpina* in Great Britain and Ireland.

vegetative spread via long-lived rhizomes. It has a wide range of hosts, including *Andromeda polifolia*, *Astragalus alpinus*, *Pinguicula vulgaris* and *Tofieldia pusilla*.

*Bartsia alpina* is capable of self-fertilisation but is not autogamous (Taylor & Rumsey 2003). Flowers are protogynous, and therefore require pollination. This is mainly achieved by visitation from bumble-bees (*Bombus* sp.), with each flower normally only receiving a single visit (Taylor & Rumsey 2003). After flowering the stems die-down and new buds are formed in the axils of the uppermost scale leaves; these over-winter and emerge above-ground in late May.

Seed germination occurs in the June following flowering (Taylor & Rumsey, 2003). Seeds (1.8–2.2 x 1.1–1.3 mm) are trigonous, reniform, have longitudinal transversal grooved wings and a slightly lustrous, whitish to pale brown surface (Bojňanský & Fargašová, 2007). It is unclear how important seed is for maintaining populations. There can be substantial pre-dispersal seed loss because of predation by the larvae of a species of microlepidoptera, and this predation also seems to reduce the germination of apparently undamaged seed (Lusby & Wright, 1996). However, seedlings have been noted occasionally in Britain and, although their survival has not been monitored, their presence indicates that recruitment does sometimes take place.

### THREATS

In England and the Breadalbanes *B. alpina* has been lost from pastures through over-grazing, trampling by cattle and drainage, and recent monitoring work on Widdybank Pasture, a heavily cattle-grazed site in Upper Teesdale, has shown a long-term decline in the size of the population (Jerram, 2011). Populations on rock ledges have been less affected by grazing animals, but there seems little doubt that grazing restricts its occurrence on some montane sites in Scotland (Taylor & Rumsey, 2003).

### MANAGEMENT

Light grazing and some trampling by cattle or sheep are crucial for the maintenance of populations in hummocky flush-pasture, by keeping the lush vegetation down and the habitat open (Pigott, 1956). However, as noted above, over-grazing will lead to excessive compaction of fragile soils and subtle alterations to hydrology. In addition, livestock should be removed during summer months to allow *B. alpina* and other associate species to flower and set seed.

### REFERENCES

- Bojňanský, V. & Fargašová, A. 2007. *Atlas of seed and fruits of Central and East-European Flora*. Springer, The Netherlands.
- Jerram, R. 2011. *Widdybank Pasture – Repeat Recording of Base-rich Flushes*. Unpublished report to Natural England.

## *Bartsia alpina* L.

Lusby, P. & Wright, J. 1996. *Scottish Wild Plants. Their History, Ecology and Conservation*. Royal Botanic Garden Edinburgh and The Stationery Office, Edinburgh.

Pigott, C.D. 1956. The vegetation of Upper Teesdale in the North Pennines. *Journal of Ecology* 44: 545-586.

Raven, J. & Walters, S.M. 1956. *Mountain Flowers*. *New Naturalist* 33. Collins, London.

Taylor, K. & Rumsey, F.J. 2003. *Bartsia alpina* L. Biological Flora of the British Isles, No. 231. *Journal of Ecology* 91: 908-921.

Wigginton, M.J. & Rothero, G. 1999. *Bartsia alpina* L. (Scrophulariaceae). In: M.J. Wigginton (ed.), *British Red Data Books. 1. Vascular Plants*, third edition, pp.57-58. Joint Nature Conservation Committee, Peterborough.

### AUTHOR VERSION

Kevin Walker. Version 1: 18 September 2015.

### SUGGESTED CITATION

Walker, K.J. 2015. *Bartsia alpina* L. Alpine Bartsia. Species Account. Botanical Society of Britain and Ireland.