

## *Kobresia simpliciuscula* (Wahlenb.) Mack.

### False Sedge

*Kobresia simpliciuscula* is a slender, sedge-like plant with narrow, chestnut-brown or black inflorescences composed of 3-10 overlapping spikelets, tufted narrow shiny mid-green leaves, and rich orange-brown leaf sheaths. It is associated with infertile calcareous soils and is found in base-rich flushes, small sedge mires and sugar limestone grassland. In England it is confined to Upper Teesdale and in Scotland populations are centered on the Breadalbane Range in Perthshire extending westwards to Argyll. It is absent from Wales and Ireland. *K. simpliciuscula* is assessed as of Least Concern in Great Britain and is also Nationally Rare.



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### IDENTIFICATION

*Kobresia simpliciuscula* can be difficult to find amongst other sedges and grasses. It is, however, very unlikely to be found far outside of its known range and habitat. When in flower it has a narrow, chestnut-brown to black inflorescence composed of 3-10 overlapping spikelets which elongate to greatly exceed the leaves.

The lack of a utricle (the flask-shaped structure surrounding the female flower in true sedges) is diagnostic and accounts for the strikingly narrow, chaffy inflorescence which appears simple and spike-like early on but splays as it matures. This narrow 'spike' makes the stem look proportionately thicker than in true sedges.

The leaves are less than 1.5 mm wide, shiny mid-green, u-



*Kobresia simpliciuscula* at Widdybank Fell, Durham. ©Stuart Hedley.

shaped in cross-section, and arise in the 3-ranked 'triangular' fashion typical of sedges. The leaves are loosely to densely-tufted and the bases form a 'false-stem', raising the leaves above the surface. These bases are orangey-brown and this feature often becomes conspicuous in late summer.

### SIMILAR SPECIES

The most similar species with which *K. simpliciuscula* grows is *Carex capillaris*. When not in flower, *C. capillaris* can be told from *K. simpliciuscula* by its slightly wider leaves, a less-marked difference between the green tissue of the leaf blade and the pale brown of the sheath and, under a lens, a ladder-like pattern on the upper surface recalling the sheaths of pond-sedge. However, it is often easiest to find the remains of inflorescences to distinguish these two species after their fruits have fallen.

### HABITATS

*Kobresia simpliciuscula* is a montane plant of very infertile calcareous stony and grassy flushes, small sedge mires and sugar limestone grassland (Smith 1999).

It grows in two types of vegetation. The first is base-rich NVC M10b *Carex dioica*-*Pinguicula vulgaris* mire, *Briza media*-*Primula farinosa* sub-community, and less commonly on a stonier, more open *Gymnostomum recurvirostrum* sub-community (M10c; see photo above). The second is noticeably drier CG9d *Sesleria albicans*-*Galium sternerii* grassland, *Carex capillaris*-*Kobresia simpliciuscula* sub-community, where it may be much less conspicuous. These two habitats sometimes intergrade.

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### BIOGEOGRAPHY

An Arctic-montane species with a circumpolar distribution in arctic and sub-arctic regions of Europe (including Svalbard and eastern Greenland; Engelskøn et al. 2003), Asia (Len Delta, Chkotka) and North America (Alaska, northern Canada). South of the arctic it has a disjunct distribution centred on alpine regions in North America south to northeastern Utah and central Colorado (Lesica & McCune 2004; Decker et al. 2006), Anatolia and Central Asia. In Europe, scattered populations occur in Scandinavia, the Alps, the Pyrenees and the Carpathians (Puşcaş 2012).

In Britain it is confined to two areas. In England, it is confined to Upper Teesdale where it is very localised, extending only about 3 km eastwards from Widdybank Fell and Birkdale (Cumbria) to Wheysike, with a much sparser equivalent scattering of records on the Yorkshire side of the River Tees. In Scotland, populations are centered on the Breadalbane Range in Perthshire, with outposts in Argyll, west to Beinn Donachain. It is occurs from 360 m in Upper Teesdale to 1065 m in Perthshire.

### ECOLOGY

*Kobresia simpliciuscula* is a tufted perennial capable of vegetative spread via short rhizomes and locally forming an abundant or even the dominant component of mire vegetation.

The terminal spike contains all male flowers, whereas those below may contain both sexes with the male at the apex, or



Distribution of *Kobresia simpliciuscula* in Great Britain and Ireland.

only female (Decker et al. 2006). Unlike other members of the Cyperaceae, the utricle does not fully enclose the nut, being open at least at its apex and often down its side (Jermy et al. 2007). It is wind-pollinated and flowers in June and July.

Achenes are 2-3 mm long with 10-28 produced per inflorescence (Decker et al. 2006). Seeds exposed to light do not germinate for 8 months in dry storage (Arnold 1973), suggesting that seeds are dormant when dispersed and do not germinate until the following spring (Decker et al. 2006). There are no special adaptations for seed dispersal and it is not known whether it occurs in the seed bank. As individual plants are relatively long-lived, reproduction by seed is probably rare, germination only occurring where the vegetation is open (Smith 1999).

### THREATS

Much of the English population of *K. simpliciuscula* was drowned during the construction of Cow Green Reservoir (Smith 1999). Today, the majority of the remaining populations are probably secure within mires on Widdybank Fell, although Jerram (2011) reports a significant decline in occurrence in Widdybank Pasture (see below) due to expansion in coarse vegetation, notably tall rushes (*Juncus effusus*, *J. acutiflorus*) and *Molinia* tussocks brought about by reductions in cattle grazing and a shift away from hard-mouthed traditional breeds. Concern has been expressed (e.g. Hedley 2012; Margaret Bradshaw, pers. comm.) that it may also be suffering from competition with *Sesleria* in its drier localities on Widdybank Fell, following a decade of lower spring grazing.

Other factors include increasing temperatures which has been shown to lead to a decline in the abundance of *K. simpliciuscula* at the southern edge of its range in North America (Lesica & McCune 2004), and eutrophication of soils due to atmospheric deposition of nitrogen which have been shown to have polluted soils on Widdybank Fell (Turner et al. 2003).

### MANAGEMENT

The plant appears capable of tolerating heavy grazing for many years, when it reproduces few, if any, flowers (Smith, 1999). In comparison it flowers prolifically in the absence of grazing (Jeffrey & Pigott 1973). However, *K. simpliciuscula* is rapidly outcompeted by grasses when soils are fertilized with nitrogen and phosphorous (P), suggesting that it is only able to achieve dominance on substrates where nutrients (in particular P) are limited (Jeffrey 1971; Jeffrey & Pigott 1973).

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### AUTHOR VERSION

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