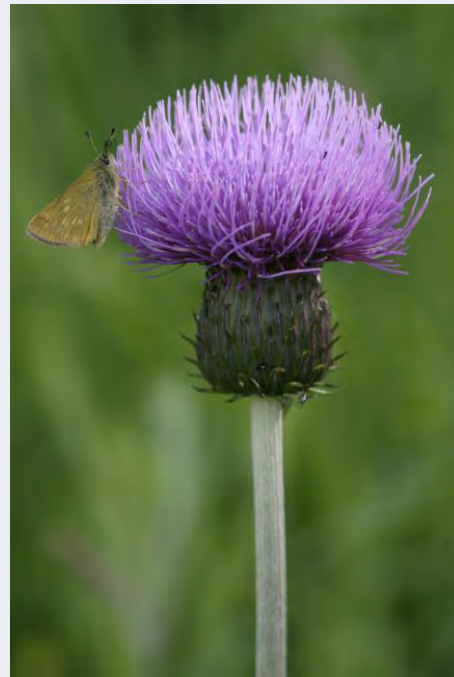


Cirsium heterophyllum L.

Melancholy Thistle

Cirsium heterophyllum is tall thistle with cottony, furrowed stems, large purple flower heads and basal leaves densely white-felted on the underside and with soft, spine-tipped teeth. It is a plant of damp, base-rich soils, found in unimproved hay-meadows and verges, woodland margins and glades, stream sides and steep bankside vegetation. It is widespread across Scotland and northern England, south to the Pennines and Radnorshire, it is now rare in Wales and only recently discovered in Ireland. It is assessed as of Least Concern in Britain, but as Endangered in Wales and Near Threatened in England.



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IDENTIFICATION

The tall, erect, cottony, furrowed stems (60-150 cm) of *C. heterophyllum* usually bear a single terminal purple flower head 3-5 cm across. The solitary capitulum (2-3 × 2-3.5 cm) is surrounded by acute and purple-tipped involucre bracts (Stace 2010). Large, long-stalked, elliptic-lanceolate basal leaves 15-40 cm × 4-8 cm (Poland & Clement 2009) are ± glabrous above but densely white-felted below, and have soft, spine-tipped teeth. The upper leaves are much smaller than the lower leaves and clasp to the flowering stem. Flower heads initially droop, with this observation leading to an association with melancholia.

SIMILAR SPECIES

The hybrid between *C. heterophyllum* and *C. palustre* (*C. × wankelii*) has characters intermediate with both parents and



Cirsium heterophyllum at Meall Corranaich, Perthshire. ©Pete Stroh.

is thinly scattered across its range, with records from ten vice-counties in Scotland and from three vice-counties in England.

HABITATS

C. heterophyllum is a plant of damp or moist unimproved habitats often occurring on base-rich soils in traditionally managed upland hay-meadows, in the grykes of limestone pavements, on road-side verges, in woodlands, on stream sides and riverbanks, and in rough hill pasture (Swan 1993; Halliday 1997; Perring 2002; Hill et al. 2004; Abbott 2005).

It is frequently associated with NVC MG3 *Anthoxanthum odoratum*-*Geranium sylvaticum* grassland, U17 *Luzula sylvatica*-*Geum rivale* montane ledge vegetation, and the steep and sheltered bankside vegetation of U19 *Thelypteris limbosperma*-*Blechnum spicant*. It occurs more rarely within the *Crepis paludosa* sub-community of W9 *Fraxinus excelsior*-*Sorbus aucuparia*-*Mercurialis perennis* woodland where it can be found with *Trollius europaeus* and, more rarely, *Crepis mollis* (Rodwell 1991, 1992).

Across its European range *C. heterophyllum* is also known as an associate of moist mesotrophic grasslands and sub-Atlantic humid meadows of the *Trisetum-Polygonum* where it grows with *C. mollis* and *Persicaria bistorta*, and of spectacular species-rich tall-herb montane meadows with *Carum carvi*, *Cicerbita alpina*, *Geranium sylvaticum*, *Phyteuma orbiculare*, *Salvia pratensis*, and *T. europaeus*. It is also found on the edges of abandoned *Carex appropinquata*-*Carex elata*-*Calamagrostis canescens* fen vegetation where it is the host for *Orobanche reticulata* (Ekman et al. 2007).

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BIOGEOGRAPHY

Cirsium heterophyllum has a Eurosiberian Boreal-montane geographic element, with its range extending southwards to the Pyrenees and Transylvania. In Britain it is predominantly a sub-montane species, found at altitudes of up to 975 metres. It has a northern distribution extending from Scotland south to the Derbyshire and Staffordshire Pennines, with its southernmost range limit occurring at Abbeycwmhir in Radnorshire.

Populations are widespread throughout Scotland and northern England, although a decline of c.20% has been detected for English populations since 1930 (Stroh *et al.* 2014) and in Wales *C. heterophyllum* has experienced substantial declines and is now known from only four locations with a total population not exceeding 250 individuals (Dines 2008). Despite its very distinctive appearance, the first record from Ireland is as recent as 1949, from a heavily grazed hay meadow by the Roogagh River in western Fermanagh (Forbes & Northridge 2012). The possibility exists that these plants may be accidental introductions with animal fodder, although the botanists who first discovered the species in Ireland were certain it was indigenous to the area (Carrothers *et al.* 1950).

ECOLOGY

A stoloniferous, perennial hemicryptophyte of damp mesotrophic grassland, flowering from June to August.

Although sites are often base-rich, across its range the species can grow on a wide variety of soils providing adequate

moisture is available. For example, in western Germany it is most frequent in damp, moderately acid and moderately nitrogen-rich sites (Reif & Weiskopf 1988).

C. heterophyllum fruits are whitish-yellow or pale violet obconical achenes (3.8 mm × 1.2-1.6 mm) that have a narrow collar at the apex and a whitish pappus of hairs 5-6× longer than the achene (Bojňanský & Fargašová 2007). In Britain, *C. heterophyllum* has been reported as producing very little viable seed (Halliday 1997), and seed production has been shown to decline to only 1.2% of its maximum at its southern British range limits (Jump & Woodward 2003). High pre-dispersal seed mortality has also been reported due to predation and parasitism (Skuhrovec *et al.* 2008). Although propagules are adapted for wind-dispersal, it is likely that long-distance dispersal and subsequent establishment by seed is rare (see also Tackenberg *et al.* 2003), and that vegetative spread is therefore the main means of reproduction, with the thistle often found in large clonal patches.

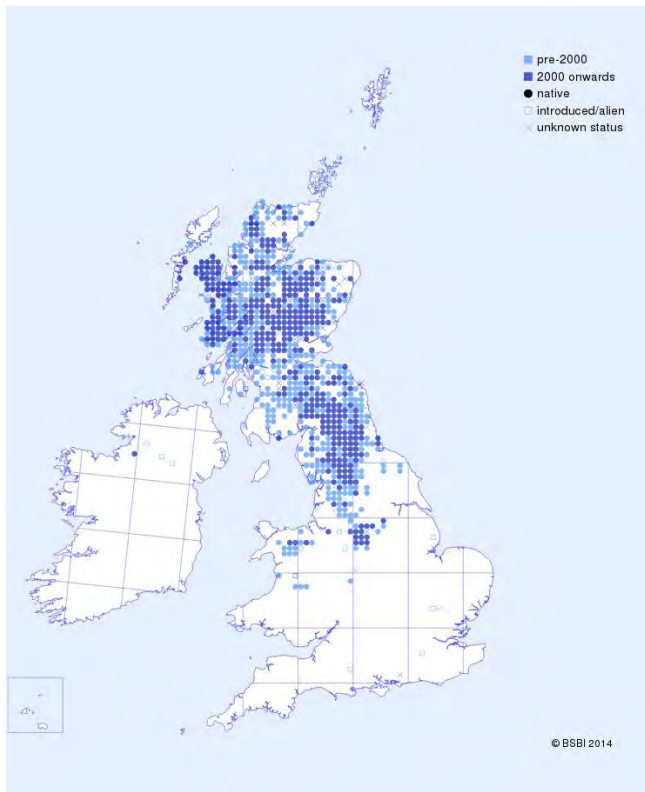
The species can persist for several years in the absence of grazing or cutting management, but plants will eventually be replaced by more competitive species (Reif & Weiskopf 1988). Across its European range, *C. heterophyllum* has been recorded as naturally hybridising with *C. acaule*, *C. arvense*, *C. oleraceum*, *C. palustre*, and *C. rivulare* (Bureš 2003). Of these, only the hybrid with *C. palustre* is confirmed from Britain. Undetermined plants resembling the hybrid with *C. arvense* were collected from rough marshy ground with both parents in Ardtornish, Argyll in the 1960s and 1970s, but have not been seen since (K.J. Walker pers. comm.).

THREATS

Threats include grassland 'improvement', ploughing and re-seeding, changes to roadside verge management and the increased practice of silage-making in fields that were previously managed as hay meadows (Jefferson 2005). Field trials conducted by Aune *et al.* (1995) suggest that *C. heterophyllum* is sensitive to over-grazing, and Ratcliffe (1977) notes that the restriction of this species to cliff ledges in some areas is probably a result of the heavy deer grazing of open woodland.

MANAGEMENT

Hay meadow management should follow the traditional practices of grazing during the autumn, winter and early spring followed by the removal of stock in May. The timing of the hay cut depends upon a number of factors e.g. weather conditions, altitude, proximity to the farm, but a cut is usually taken in July or August. Livestock are then returned to the meadow to graze the aftermath. Occasional spreading of low levels of farmyard manure in late April or early May helps to produce a healthy crop for the farmer without adversely affecting species diversity, and light applications of lime are also intermittently added to maintain neutral soil pH conditions.



Distribution of *Cirsium heterophyllum* in Great Britain and Ireland.

Cirsium heterophyllum L.

Roadside verge management should replicate the timing of cutting for hay meadow management described above, with cuttings removed.

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