

Potentilla fruticosa L.

Shrubby Cinquefoil

Potentilla fruticosa is a deciduous shrub with pinnate leaves and attractive yellow flowers with petals longer than sepals. Although cultivars of this species are widely planted throughout the British Isles *P. fruticosa* is rare as a native. It is restricted to Upper Teesdale, where it is most often found in base-rich streamside vegetation, the Cumbrian Fells, where it occurs as a montane plant of damp rock ledges, and the Burren region of western Ireland, where it is associated with turloughs, scrub and fen meadow. It is assessed as Near Threatened in Great Britain due to its restricted distribution and recent decline.



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IDENTIFICATION

Potentilla fruticosa is a deciduous flowering shrub typically attaining about a metre in height, although plants may be very much smaller. It is simple to identify when in flower: excluding the prostrate *Helianthemum* species, it is the only British native shrub bearing regular, showy yellow flowers with petals (6–16 mm) much longer than the sepals (Stace, 2010). The pinnate leaves are distinctive (although they sometimes appear palmate in small specimens), allowing summer recognition of small, grazed or layering plants only a few centimeters tall in riverside turf.

Plants in winter are best identified by a combination of physical and habitat characters: a small bush with noticeably thin branches, peeling bark and often some dead calyces persisting; a stipule character given below is useful for dwarf



Potentilla fruticosa in typical habitat next to the River Tees at Holwick Bridge, County Durham. ©Jeremy Roberts

material. Bare winter stems often trap flood debris, creating a characteristically scruffy appearance.

SIMILAR SPECIES

In mature deciduous shrubs of other species may cause problems in winter. *P. fruticosa* typically combines quite dense branching from multiple, clustered stems with a fine, whippy branch form. The remains of the previous year's stipules can be seen on most nodes and this confirms the plant. *P. fruticosa* cultivars (e.g. 'Primrose Beauty', 'Chelsea Star', 'Jackman's Variety', 'Goldstar', 'Goldfinger') are widely planted in parks, gardens and public spaces throughout Britain and Ireland. The RHS website lists many of the available cultivars.

HABITATS

In the British Isles *P. fruticosa* is a rare species of unshaded habitats, including rock ledges, river and lake margins and fens (Elkington & Woodell, 1963).

In Teesdale, one of its few native locations in Britain and Ireland, it is almost always associated with the stream channel of the River Tees where it grows on riverine deposits in a medium- to well-advanced stage of colonisation by other species, or in crevices in limestone or dolerite bedrock within the river's flood range (NVC CG9 *Sesleria albicans*-*Galium sternerii* grassland and CG10 *Festuca ovina*-*Agrostis capillaris*-*Thymus praecox* grassland). Rarely, colonies can be found in other habitats nearby.

In the Lake District it occurs as a montane plant in vegetation with affinities to NVCCG14 *Dryas octopetala*-*Silene acaulis* ledge communities on loose, crumbly montane rock ledges

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and associated screes (Porter & Roberts, 1999) and in Ireland it is found in open scrub and *Molinia* fens associated with turloughs (e.g. NVC M24 *Molinia caerulea*-*Cirsium dissectum* fen-meadow; W22 *Prunus spinosa*-*Rubus fruticosus* scrub).

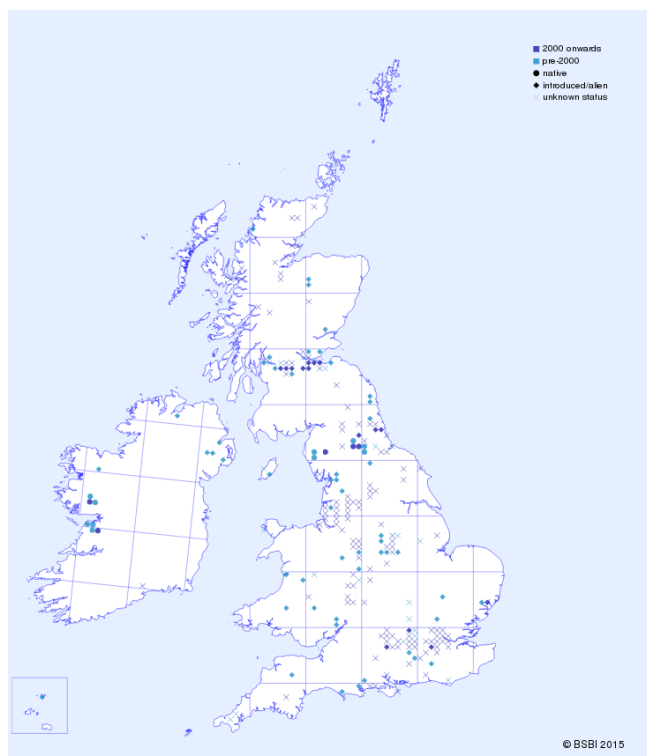
BIOGEOGRAPHY

Globally *P. fruticosa* is the most widespread of a group of shrubby cinquefoils centred on Asia. It has a circumpolar Boreal-montane world distribution, but as in Britain and Ireland, it has a curiously disjunct distribution, with populations in the Pyrenees, maritime alps, Rhodope mountains, the Baltic (Öland, Gotland, Estonia, Latvia), Urals, Caucasus, central Asia, Himalaya, Japan, Greenland and North America, extending from arctic Alaska south to Mexico and eastwards to Newfoundland.

In Britain and Ireland, as mentioned above, cultivars of this species have been widely planted, but it is restricted, as a native, to Upper Teesdale, the Cumbrian Fells and the Burren region of western Ireland. It occurs from sea-level in western Ireland to c.420 m below Falcon Clints in Teesdale, and 700 m on Pillar in the Lake District. It also occurred as an accidental introduction at c.850 m on Great Dun Fell, Teesdale, in 1999 where it appears to have now died-out (Linda Robinson, pers. comm.).

ECOLOGY

Potentilla fruticosa grows in a range of places which, although ostensibly different, are usually all constantly moist, well lit, moderately base-rich, and relatively free from competition



Distribution of *Potentilla fruticosa* in Great Britain and Ireland.

owing to a rocky or stony substrate

Plants are deciduous and flower from May to September, with the leaves falling in late autumn. Vegetative spread takes place by means of creeping stems just below the soil surface, which can detach to form new plants (known as layering). This has been observed in Teesdale (Natural England, 2009), a process which can no doubt prolong the life of bushes and explains the occurrence of small or casual populations downstream of the main ones (Graham, 1993). Layering may also account for the persistence of some potentially very old plants in closed habitats e.g. limestone grassland and heath.

North European populations, including those in Britain, are tetraploid ($2n = 28$) and dioecious (Elkington, 1969). Cross-pollination is therefore obligatory and is mainly carried out by Diptera (Elkington & Woodell, 1963). In dioecious plants the male flowers have numerous well-developed stamens and a receptacle bearing a bunch of hairs, whereas the female flowers have receptacles bearing numerous, one-seeded carpels interspersed with hairs and their stamens, are generally smaller than the male flowers, and do not produce 'good' pollen (Elkington, 1969).

The seed is a small achene with a ring of hairs at its base which presumably aids dispersal by wind and water. British and Irish plants appear to set seed freely (Porter & Roberts, 1999) although seed production appears variable (averaging 20-70 seeds per capsule) and dependent on the severity of the climate (Elkington & Woodell, 1963). The seeds lie dormant over the winter months and germinate in the spring.

THREATS

Populations found along river corridors appear to have exploited a typical but essentially unstable niche, and there is evidence in Teesdale that changes in flow since construction of the Cow Green dam in 1970 now present a tangible, if not acute, threat. Seedlings were recorded in only two out of nine populations sampled by Natural England (2009), both in dolerite cracks recently replenished with sediment, and such circumstances now seem scarce. Dam construction may have changed sediment supply, reducing opportunities for seedling establishment, and reduced spates may have promoted more scrub succession. For example, remaining plants at Calf Holm are now 'squeezed' between shading scrub and current-scoured cobbles too coarse to act as a seedbed.

Grazing does not appear to be a threat to British and Irish populations unless there is a dire absence of more palatable herbage (Elkington & Woodell 1963). Populations occurring on ledges are sporadically vulnerable to rock-fall.

MANAGEMENT

Grazing may be beneficial in suppressing potential competitors (Porter & Roberts, 1999) although low palatability to stock has been reported (Elkington & Woodall, 1963) and the great majority of bushes now occur in places to which stock have little access. Management for riverine

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populations requires more investigation, but appears to require a less regulated fluvial system to allow for natural spate and the creation of suitable opportunities for seedling establishment.

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AUTHOR VERSION

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SUGGESTED CITATION

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