

## *Juncus compressus* Jacq.

### Round-fruited Rush

A slender, round stemmed rush with flattened leaves, a terminal inflorescence, and rounded light-brown tepals and seed capsules. It is a species of weakly acid to weakly basic soils found in damp pasture, meadow and marshland, often in areas that rapidly dry out after being submerged over the winter and early spring, and occasionally in brackish conditions in coastal areas. It is a rare species in Wales, Scotland and Ireland, and widespread but scattered throughout southern, central and northwest England. Declines across its range have resulted in assessments of Near Threatened for Great Britain, Vulnerable for England and Endangered for Wales.



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#### IDENTIFICATION

*Juncus compressus* has erect, solid, slender and rounded stems (~80 cm) and short, firmly-rooted rhizomes, lending the rush a loosely tufted appearance. Basal leaves are 5-35 cm long and 0.8-2 mm wide, flattened and slightly inrolled (Stace 2010).

The lax to moderately congested terminal inflorescence consists of 5-60 flowers (Brooks & Clements 2000), with the lowest bract usually exceeding the height of the inflorescence. Individual flowers have six stamens, filaments measuring 0.5-0.7 mm, anthers 0.6-1 mm (Brooks & Clements 2000; Stace 2010), and obtuse to rounded, light brown tepals.

Capsules (2.5-3.5 × 1.4-1.8 mm) exceed the tepals and are semi-globose, hence the common name of 'round-fruited'. Individual seeds are light brown, ellipsoid to lunate, and

measure 0.35-0.46 mm (Nasir & Ali 1980-2005).

#### SIMILAR SPECIES

*Juncus compressus* is a polymorphic species which has led to much taxonomic confusion in the past. It is often mistaken for *J. gerardii* (Saltmarsh Rush), particularly at coastal locations, and both may occur in the same habitat (Rich & Jermy 1998). However, *J. gerardii* has longer anthers (1-2 mm) that are at least twice as long as the filaments. *J. gerardii* also has larger seeds (0.5-0.7(-0.85) mm) than *J. compressus* (Nasir & Ali 1980-2005; Mike Wilcox pers. comm.). In addition, the length of the lowest bract is typically shorter than the height of the terminal inflorescence.

#### HABITATS

*Juncus compressus* is associated with damp, open, weakly acid to weakly basic sandy or gravelly soils, often close to open water. It is recorded from marshes, wet meadows and pastures, sometimes near the sea in brackish conditions (Stace 2002), although many coastal records for this species in the British Isles are contested. It is also found on the edges of man-made ponds and reservoirs, roadside verges, degraded fens, in seasonally wet fields that have recently been reverted from arable, and river corridors (Corner 2011; Pete Stroh, pers. obs.).

In North America, where the species is considered an introduction, inland populations occur on motorway verges amongst other halophytes, along railways and canal banks, and on disturbed roadside ditches (Brooks & Clements 2000).



A population of *Juncus compressus* on the edge of Pitsford Reservoir, Northamptonshire. ©Pete Stroh

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### BIOGEOGRAPHY

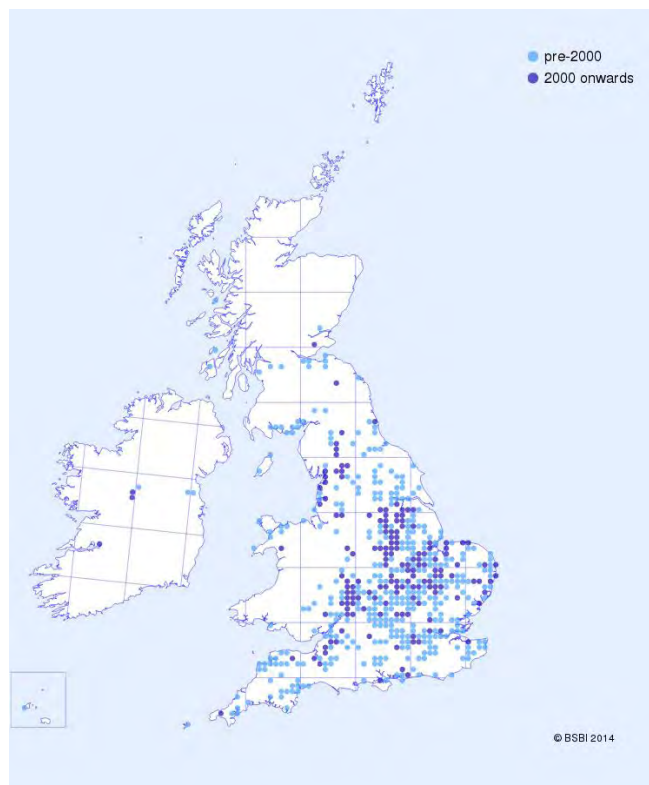
*Juncus compressus* has a Eurosiberian Temperate element (Stace 2002) and is native and widely distributed across Europe and extra-tropical Asia. It is also widely naturalised outside its native range (e.g. North America). Populations in Norway represent the northern limit for this species, with the southern and eastern limits found in Jammu and Kashmir states on the border of Pakistan and India.

*J. compressus* is widespread but localised across much of southern, eastern, central and northwest England. It was once regarded as common across Devon, Cornwall and southeast England but has experienced substantial declines in these areas. In Wales, *J. compressus* may be present in as few as four locations (Dines 2008), and it is also a rare species in Scotland, with recent records from Dumfriesshires, Roxburghshire and South Ebuades. In Ireland it is still present in Galey and Portrunny Bays in Roscommon, and at Finn Loch, County Clare.

Its British altitudinal range is from sea-level to 390 m (above Dent Station, North-west Yorkshire). It is regarded as a lowland species here, although it may be found at up to 2100 m in North America (Brooks & Clements 2000).

### ECOLOGY

*Juncus compressus* is a perennial, non-bulbous geophyte, with a cespitose appearance in the field. Flowering takes place from May to July, with the peak period for seed release occurring in early autumn (Skoglund 1989).



Distribution of *Juncus compressus* in Great Britain and Ireland.

It has the potential to generate a long-lived seed bank (Thompson et al. 1997) due to the huge number of small, viable seeds produced by each parent plant on each fruiting occasion.

Seed dispersal is presumably by water (hydrochory), with secondary modes including attachment to mud on the feet and plumage of birds (Burkart 2001). Propagules may become attached to livestock grazing near to the margins of water bodies, and can be dispersed endozoochorously (internally) following accidental consumption (Stroh et al. 2012).

Conditions for germination require localised disturbance leading to the exposure of buried seeds, and the creation of bare, moist ground with access to partial or full sun and warm temperatures (Grime et al. 2007).

### THREATS

Declines have been attributed to a loss of permanent pasture and the efficient drainage of suitable habitat for arable farming and other purposes. However, *J. compressus* appears to be able to quite quickly disperse and establish in new sites near to extant populations if suitable conditions are provided (e.g. the Wicken Fen Vision, Cambridgeshire).

### MANAGEMENT

The creation of ephemeral drawdown zones near to extant sites is likely to provide suitable conditions in most years for the recruitment of *J. compressus* if viable seeds are either present in the soil or are able to immigrate and establish from an *ex situ* source. Livestock grazing, particularly by cattle, will create patches of bare ground, reduce competition by competing rushes and other vegetation on the edges of drawdown zones, and also provides a means of propagule dispersal.

The timing of a cutting regime on roadside locations or for areas that have no grazing management should ensure that a proportion of plants have the opportunity to flower and set seed. **The creation of shallow 'micro-scrapes' using mowing equipment** may also be beneficial, particularly if the population persists within a tightly structured sward

### REFERENCES

- Brooks, R.E. and S.E. Clements. 2000. Juncaceae In: *Flora of North America, Volume 22*. Flora of North America Editorial Committee, Oxford University Press, New York.
- Burkart, M. 2001. River corridor plants (Stromtalpflanzen) in Central European Lowland: a review of poorly understood plant distribution patterns. *Global Ecology & Biogeography* 10: 449-468.
- Grime, J.P., Hodgson, J.G. & Hunt, R. 2007. *Comparative Plant Ecology: A comparative approach to common British Species*. Castlepoint Press, Kirkcudbrightshire.

## *Juncus compressus* (Jacq.)

Nasir, E. & Ali, S.I. (eds). 1980-2005. *Flora of Pakistan*, University of Karachi, Karachi.

Skoglund S.J. 1989. Seed dispersing agents in two regularly flooded river sites. *Canadian Journal of Botany* 68: 754–760.

Stace, C.A. 2002. *Juncus compressus* Jacq. In: C.D. Preston, D.A. Pearman & T.D. Dines (eds & comps) *New Atlas of the British and Irish Flora*. p.688. Oxford University Press, Oxford.

Stace, C. A. 2010. *New Flora of the British Isles*, third edition. Cambridge University Press, Cambridge

Stroh, P. A., Mountford, J. O., Hughes, F. M. R. 2011. The potential for the endozoochorous dispersal of temperate fen

species by free-roaming horses. *Applied Vegetation Science* 15: 359-368.

Thompson, K., Bakker, J. P., & Bekker, R. M. 1997. *The Soil Seed Banks of North West Europe: Methodology, Density and Longevity*. Cambridge University Press, Cambridge.

### AUTHOR VERSION

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