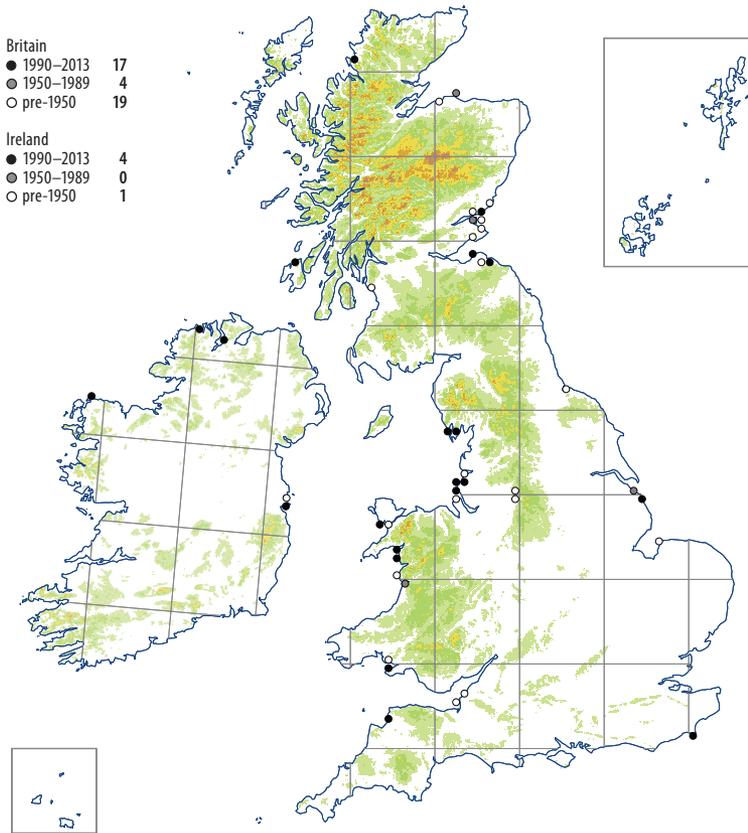
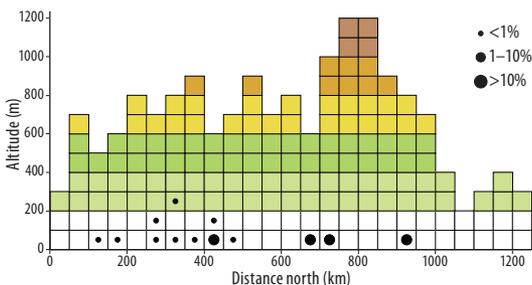


# Bryum warneum



A moss of unshaded or lightly shaded, damp, basic coastal sand that grows mainly as a colonist in the early vegetation succession of dune slacks and damp foredunes, more rarely in coastal gravel pits and on machair. It is often associated with other species of *Bryum*, especially *B. algovicum* and *B. dichotomum*, more rarely with *B. archangelicum*, *B. calophyllum*, *B. dyffrynense*, *B. intermedium* or *B. knowltonii*, along with *Juncus bufonius*, *J. gerardii*, *Glaux maritima* and sparse or patchy grasses and sedges. Unusually, it was found at an inland site in 2013 in the crevice of a sandstone slab by Loch Stemster, Caithness (too late to be shown on the map). Altitudinal range: 0–25 m (and at 145 m at the recently discovered inland site).

Recent targeted surveys in England, Wales and Ireland (Holyoak, 2001c, 2002a, b; Lockhart *et al.*, 2012) have led



to new records of *B. warneum* in N and W Ireland but also provided evidence of decline at some of its sites in England and Wales, often due to stabilisation of coastal sand habitats. However, new foredune habitat at Birkdale Green Beach (S Lancashire) supported more than a hundred patches along 1.4 km of coast for a few years around 2002, before declining due to vascular plant succession (Holyoak, 2002b, 2010a).

Mainly autoicous, but a population at Dungeness (Kent) is synoicous; capsules are plentiful, maturing mainly in autumn with a few records in most other months. Bulbils, axillary gemmae and tubers are absent; protonemal gemmae are produced in culture (Pressel *et al.*, 2007).

The status of both autoicous and synoicous *B. warneum* as a single species is supported by molecular data (Bell *et al.*, 2013). *B. mamillatum* was formerly regarded as a distinct and very rare species, but was merged with *B. warneum* by Holyoak (2004).

European Boreal-montane. Widespread but local in N, W and C Europe, from Iceland and Arctic Norway to N France and Hungary. Recently reported from Turkey (Batan & Özdemir, 2013). Known elsewhere from Asia (Altai and Baikal) and Canada (Quebec), with reports from Alaska and Greenland now regarded as erroneous.

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