MG9
Holcus lanatus-Deschampsia cespitosa grassland

Synonymy
Deschampsietum caespitosae Horvatic 1930 *p.p.*; *Arrhenatheretum elatioris deschampsietosum caespitosae* LeBrun *et al.* 1949; Tussocky neutral grassland Duffey *et al.* 1974; *Juncus-Carex hirta-Deschampsia cespitosa* nodum Wheeler 1975 *p.p.*; Moist *Deschampsia-Dactylis* grassland Rahman 1976; Ordinary wet meadows Ratcliffe 1977; *Festuco-Alopecuretum pratensis deschampsietosum caespitosae* Page 1980.

Constant species
Deschampsia cespitosa ssp. *cespitosa*, *Holcus lanatus*.

Physiognomy
The *Holcus lanatus-Deschampsia cespitosa* community has a coarse sward dominated by *D. cespitosa* and other large tufted or tussocky grasses, *Holcus lanatus*, *Dactylis glomerata* and *Arrhenatherum elatius*. The physiognomy and composition of the vegetation are somewhat varied but depend largely on the number, size and disposition of tussocks of *D. cespitosa* and on their pattern of aerial growth through the year. In closed, stable swards like the vegetation of this community, *D. cespitosa* maintains itself by the vegetative expansion of clonal individuals, each of which may come to comprise several thousand tillers arranged in a densely-caespitose tussock. Although the tillers themselves are short-lived, with a continual turnover and gradual accumulation of dead material, whole tussocks may attain a considerable age, perhaps 30 years or more. As they grow, the tussocks do not extend their ground cover greatly but they are able to produce an increasing spread of aerial shoots each year and these may attain a height of 50–200 cm in older, well-grown individuals. There is a maximum proportion of live material in a tussock in August, after which there is extensive die-back although many leaves remain winter-green and there may also be some slow new growth during the winter (Davy 1980).

The vegetation is generally a mosaic built around the *D. cespitosa* tussocks. Where these are scattered, there is between them a sward, often cropped short by preferential grazing, in which *Holcus lanatus*, *Festuca rubra*, *Agrostis stolonifera*, *A. capillaris*, *Poa trivialis*, *Dactylis glomerata*, *Lolium perenne* and *Alopecurus pratensis* may each be locally abundant. Dicotyledons are numerous and varied but none is constant. The most frequent species are *Ranunculus repens*, *R. acris*, *Cirsium arvense*, *Rumex acetosa*, *Cerastium fontanum*, *Plantago lanceolata*, *Lathyrus pratensis* and *Centaurea nigra*. The particular combination of these grasses and dicotyledons in the sward between the tussocks is frequently a reflection of the type of grassland in which *D. cespitosa* has become established. Among other occasionals, poor-fen species may be conspicuous: *Juncus effusus* and *J. inflexus* sometimes occur as scattered clumps and *Filipendula ulmaria*, *Cardamine pratensis*, *Angelica sylvestris*, *Carex hirta*, *Lotus uliginosus* and *Achillea ptarmica* may be encountered at low frequency.

Where the *D. cespitosa* tussocks are close and especially where large tussocks produce a continuous canopy of extended leaves in summer, there is a reduction in diversity in the vegetation. Some species, such as *Dactylis* (Rahman 1976: see below), seem able to compete effectively with *D. cespitosa* under certain soil conditions, but many succumb to the increased lack of ground space and of light. In early spring in such stands, and particularly where the *D. cespitosa* has been grazed hard back over the winter, there may be considerable areas of bare soil and some grasses (e.g. *H. lanatus*, *A. stolonifera*, *L. perenne*, *Alopecurus pratensis*) may show a temporary abundance before the leaves of *D. cespitosa* extend. Between fully-expanded tussocks, however, there is often a very sparse ground cover of spindly *P. trivialis* and *A. stolonifera* with a little *Ranunculus repens*. Certain sprawlers, such as *Lathyrus pratensis* and *Lotus uliginosus*, and some taller dicotyledons, such as *Filipendula ulmaria*, *Centaurea nigra*, *Angelica sylvestris* and *Rumex crispus*, are able to grow up among the tussocks but, in many cases, such stands are extremely species-poor and uncomprisingly dominated by *D. cespitosa*. Where such vegetation is inundated by floodwater, there may be largely bare silty runnels between

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the tussocks with scattered *Potentilla anserina* and *Mentha aquatica*.

Bryophytes are rather infrequent in the community although *Brachythecium rutabulum* and *Eurhynchium praelongum* are occasionally abundant on bare soil and decaying litter.

Sub-communities

***Poa trivialis* sub-community:** *Deschampsietum caespitosae typicum* and *Festuco-Alopecuretum pratensis deschampsietosum caespitosae* Page 1980. *D. cespitosa* is generally the most abundant species in this sub-community and it may be overwhelmingly dominant. Usually, however, there is a rather open sward in which *P. trivialis*, *Festuca pratensis*, *Alopecurus pratensis*, *Ranunculus acris*, *Trifolium repens* and *T. pratense* are preferentially frequent with occasional *Juncus effusus* and *Filipendula ulmaria* and a wide range of grassland and poor-fen species at low frequency. Bryophytes are slightly more frequent and abundant here and *Calliergon cuspidatum* is preferential.

***Arrhenatherum elatius* sub-community:** *Arrhenatheretum elatioris deschampsietosum caespitosae* LeBrun *et al.* 1949; *Deschampsietum caespitosae arrhenatheretosum elatioris* Page 1980. Here, *D. cespitosa*, *A. elatius*, *D. glomerata* and *H. lanatus* are usually co-dominant in a coarse tussocky sward. Some taller dicotyledons, such as *Centaurea nigra* and *Rumex crispus*, are preferential and, with the thick accumulation of litter, bryophytes tend to be less frequent but, otherwise, the floristics resemble those of the community as a whole.

Habitat

The *Holcus-Deschampsia* community is highly characteristic of permanently moist, gleyed and periodically inundated circumneutral soils throughout the British lowlands. It occurs patchily or as extensive stands on level to moderately steeply sloping ground in pastures and meadows, in woodland rides and clearings, on road verges and in churchyards, on river levees and at fen margins and around the upper limit of inundation by pools, lakes and reservoirs.

The maintenance of the community in such a diverse range of habitats depends largely upon the ability of *D. cespitosa* to survive and become dominant on mineral soils which are often anaerobic and oligotrophic and therefore inhospitable to many other neutral grassland species. *D. cespitosa* has a tolerance of, rather than a need for, high levels of soil moisture (Davy & Taylor 1974*a*). This tolerance may be partly due to its well-developed root aerenchyma which, by reducing oxygen requirements within the tissues, could permit oxidation of the immediate root environment and so mitigate the toxic effect of certain reduced, e.g. ferrous, ions (Martin 1968, Rahman 1976). *D. cespitosa* also has an internal system of nutrient cycling, from older to developing tillers, and this could assist in its survival on oligotrophic soils (Davy & Taylor 1974*b*, 1975, Davy 1980). Further, it has a broad tolerance of soil base-status. Thus, although it tends to grow most vigorously in this community on mesotrophic, periodically inundated soils, the *Holcus-Deschampsia* grassland occurs wherever *D. cespitosa* has a competitive advantage within lowland swards on gleyed brown earths, gleyed brown calcareous earths and surface- and ground-water gleys, including alluvium. Many stands have developed by the establishment and spread of *D. cespitosa* in gleyed hollows within, for example, *Lolio-Cynosuretum* and *Lolium-Alopecurus-Festuca* pastures and *Alopecurus-Sanguisorba* meadows, or where such communities come into contact with a fluctuating water-table by streams and pools.

The growth of *D. cespitosa* in such circumstances is generally vegetative and slow (see above) but some stands of the community have arisen by the explosive spread of *D. cespitosa* on to disturbed moist soils such as occur in rides and new clearings in woods on heavy clays. Vast numbers of seeds can be produced by well-grown individuals in favourable circumstances and the light, plumed caryopses are readily dispersed by wind, sometimes over hundreds of metres (Davy 1980). There is also a persistent soil seed-bank (Grime 1979).

Grazing may accentuate the competitive advantage of *D. cespitosa*. Although it is eaten by cattle (even in the lowlands, cf. Davy 1980), horses, sheep, deer and rabbits, the leaves have a high silica content and are very rough and unpalatable and, in pasture, tussocks are generally avoided if alternative herbage is available. This tends to accentuate the mosaic structure of the vegetation, although heavy trampling by cattle can damage and even flatten small tussocks. On occasion, grazing-sensitive species, such as *Filipendula ulmaria*, may become established on top of the *D. cespitosa* tussocks. When there is little bite to be had from the sward, as in winter, tussocks may be grazed hard back.

The *Poa* sub-community comprises grazed stands on various soil types and those ungrazed stands on moister soils where *D. cespitosa* has become the sole dominant. The *Arrhenatherum* sub-community is always ungrazed and tends to occur on drier soils. Here, *D. cespitosa* is unable to maintain its competitive advantage over other grasses and, in the absence of grazing, *A. elatius* and *D. glomerata* can become co-dominant. This sub-community is particularly common on road verges and in churchyards.

Zonation and succession

The community occurs very frequently as part of zonations related to differences in soil moisture status. The *Poa* sub-community is common in moist hollows within

pastures and on grazed verges where there is gleying and it commonly gives way, with a decrease in the cover of *D. cespitosa*, to *Lolio-Cynosuretum* or the *Lolium-Alopecurus-Festuca* community on better-drained soils. Around permanently wet hollows, pools and lakes, the community regularly forms part of an ecotone to some type of fen or swamp or, where there is a frequent rise and fall of water level, as around reservoirs, to a sequence of inundation communities. In many cases, it is possible to discern a range of intermediates between the *Holcus-Deschampsia* community and its neighbours and, in zonations to fen-meadows, there is, or has been in the past, the further complication of mowing and grazing effects.

Such transitional swards may also figure in seral changes that ensue in badly-managed or abandoned pastures and meadows. Once established, *D. cespitosa* cannot be totally eradicated by continued grazing and, if drainage deteriorates, it will slowly spread to dominate in the *Poa* sub-community. Even where drainage is improved, preferential grazing of other species may prevent *D. cespitosa* being ousted by possible competitors. Where there is a reduction of grazing on better-drained land, the *Arrhenatherum* sub-community may develop from pasture swards. Although a switch to mowing is probably the best form of control of *D. cespitosa* (Davy 1980), the silting up of ditches within meadows may precipitate a spread of the community.

If grazing continues, the *Holcus-Deschampsia* grassland is maintained as a plagioclimax and, even when it ceases, the densely-tussocky character of the vegetation often severely hinders any establishment of seedling shrubs and trees. Where succession to woodland does occur, it is usually to the *Deschampsia* sub-communities of the *Alnus-Fraxinus-Lysimachia* or *Fraxinus-Acer-Mercurialis* woodlands. Stands of the *Holcus-Deschampsia* grassland can often be found in rides and clearings in tracts of these kinds of woodlands or planted replacements of them in forests on heavy, clay soils with considerable continuity among the herb flora. In such situations, the *Holcus-Deschampsia* grassland can provide an important seed source for the spread of *D. cespitosa* beneath the trees when felling or coppicing increases the light.

Distribution

The community is virtually ubiquitous in suitable sites throughout the lowlands. At higher altitudes, it is replaced by sub-montane and montane grasslands in which *D. cespitosa* is represented by ssp. *alpina*.

Affinities

Floristically dull grasslands of low agricultural value or little apparent interest for conservation such as the *Holcus-Deschampsia* community have figured rarely in the descriptive literature. However, this vegetation type forms part of a well-defined series of grasslands dominated by the various subspecies of *D. cespitosa*, some elements of which have been described previously from moist soils at higher altitudes and latitudes, e.g. the *Deschampsietum caespitosae alpinum* of McVean & Ratcliffe (1962) and the *Deschampsia-Festuca-Agrostis* grassland of King & Nicholson (1964).

Lowland *D. cespitosa* grasslands have been described from various parts of the Continent (e.g. Horvatic 1930, Tüxen 1937, LeBrun *et al.* 1949, Sissingh & Tideman 1960, Westhoff & den Held 1969), although they have not always been characterised as distinct kinds of *Deschampsietum*. This reflects the fact that, apart from the dominance of *D. cespitosa* and the consequent reduction in the frequency and cover of other grassland species, many stands are very like the various communities in which the grass has but a minor hold. The drawing of boundaries between vegetation types in such cases is obviously difficult, but it seems sensible to retain a distinct unit for those stands where the species is most prominent and where it occurs with a sprinkling of poor-fen plants in a clearly defined range of habitats with a fluctuating water-table. Where lowland communities of this kind have been characterised, authorities differ as to whether they are best placed within the Calthion (with the *Holco-Juncetum*, say) or in a separate alliance, the Deschampsion, within the Arrhenatheretalia.

Floristic table MG9

	a	b	9
Deschampsia cespitosa	V (2–9)	V (1–8)	V (1–9)
Holcus lanatus	IV (2–8)	IV (2–7)	IV (2–8)
Poa trivialis	IV (2–6)	II (2–5)	III (2–6)
Ranunculus acris	II (1–4)	I (2–4)	II (1–4)
Festuca pratensis	II (1–7)	I (2–4)	II (1–7)
Anthoxanthum odoratum	II (2–6)	I (2–3)	II (2–6)

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Filipendula ulmaria	II (2–5)	I (2–3)	II (2–5)
Juncus effusus	II (2–7)	I (1–2)	II (1–7)
Taraxacum officinale agg.	II (1–3)	I (1–3)	I (1–3)
Trifolium pratense	II (1–4)	I (2–5)	I (1–5)
Trifolium repens	II (1–6)	I (3–4)	I (1–6)
Brachythecium rutabulum	II (2–7)	I (2–6)	I (2–7)
Eurhynchium praelongum	II (2–6)	I (2–5)	I (2–6)
Calliergon cuspidatum	II (1–7)		I (1–7)
Carex panicea	I (2–5)		I (2–5)
Cirsium palustre	I (1–4)		I (1–4)
Conopodium majus	I (1–4)		I (1–4)
Rumex sanguineus	I (2)		I (2)
Hypericum perforatum	I (1–2)		I (1–2)
Briza media	I (2–3)		I (2–3)
Senecio jacobaea	I (1–2)		I (1–2)
Senecio aquaticus	I (1)		I (1)
Glyceria fluitans	I (1–2)		I (1–2)
Phalaris arundinacea	I (1–5)		I (1–5)
Carex nigra	I (1–4)		I (1–4)
Rumex obtusifolius	I (3)		I (3)
Trisetum flavescens	I (1)		I (1)
Arrhenatherum elatius	I (2)	V (1–8)	II (1–8)
Dactylis glomerata	II (1–7)	V (2–5)	III (1–7)
Centaurea nigra	I (1–4)	III (2–4)	II (1–4)
Rumex crispus	I (1–3)	II (2–4)	I (1–4)
Festuca rubra	II (3–6)	III (2–5)	III (2–6)
Agrostis stolonifera	III (2–7)	III (2–9)	III (2–9)
Ranunculus repens	III (1–7)	II (1–4)	III (1–7)
Agrostis capillaris	II (3–9)	II (2–7)	II (2–9)
Cirsium arvense	II (1–6)	II (2–5)	II (1–6)
Rumex acetosa	II (1–5)	II (1–4)	II (1–5)
Cerastium fontanum	II (1–3)	II (1–3)	II (1–3)
Alopecurus pratensis	II (1–8)	II (3–7)	II (1–8)
Lolium perenne	II (1–6)	II (2–5)	II (1–6)
Plantago lanceolata	II (1–5)	II (1–5)	II (1–5)
Lathyrus pratensis	II (1–5)	II (1–3)	II (1–5)
Juncus inflexus	II (2–5)	II (2–5)	II (2–5)
Cardamine pratensis	I (2–3)	I (3)	I (2–3)
Potentilla erecta	I (2–4)	I (2–3)	I (2–4)
Rumex conglomeratus	I (3–4)	I (4)	I (3–4)
Angelica sylvestris	I (3–4)	I (2–5)	I (2–5)
Primula veris	I (2–3)	I (2)	I (2–3)
Carex hirta	I (3–4)	I (1–3)	I (1–4)
Holcus mollis	I (1–7)	I (2–4)	I (1–7)
Leontodon autumnalis	I (1–3)	I (3)	I (1–3)
Potentilla anserina	I (1–4)	I (3)	I (1–4)
Urtica dioica	I (1–2)	I (2)	I (1–2)
Rubus fruticosus agg.	I (2–4)	I (2–6)	I (2–6)
Poa pratensis	I (3)	I (3)	I (3)
Vicia cracca	I (1–6)	I (2)	I (1–6)

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Floristic table MG9 (*cont.*)

	a	b	9
Pulicaria dysenterica	I (1–2)	I (2–3)	I (1–3)
Lotus uliginosus	I (1–4)	I (2–4)	I (1–4)
Achillea millefolium	I (2–3)	I (3)	I (2–3)
Phleum pratense pratense	I (4)	I (3)	I (3–4)
Ranunculus ficaria	I (4–5)	I (4)	I (4–5)
Lotus corniculatus	I (3–4)	I (2–4)	I (2–4)
Juncus articulatus	I (2)	I (3)	I (2–3)
Mentha aquatica	I (1)	I (2–4)	I (1–4)
Danthonia decumbens	I (1)	I (3)	I (1–3)
Succisa pratensis	I (1–3)	I (3)	I (1–3)
Achillea ptarmica	I (3–5)	I (3)	I (3–5)
Rhytidiadelphus squarrosus	I (1–2)	I (3)	I (1–3)
Cynosurus cristatus	I (1–5)	I (4)	I (1–5)
Prunella vulgaris	I (1)	I (3)	I (1–3)
Festuca arundinacea	I (1–5)	I (1–5)	I (1–5)
Galium verum	I (2)	I (2)	I (2)
Silaum silaus	I (3–5)	I (1–4)	I (1–5)
Leucanthemum vulgare	I (2)	I (1–2)	I (1–2)
Dactylorhiza fuchsii	I (2)	I (1)	I (1–2)
Agrimonia eupatoria	I (1)	I (3)	I (1–3)
Hordeum secalinum	I (2)	I (3)	I (2–3)
Heracleum sphondylium	I (1–6)	I (4–5)	I (1–6)
Phleum pratense bertolonii	I (2–5)	I (3)	I (2–5)
Cirsium vulgare	I (1)	I (3)	I (1–3)
Number of samples	33	19	52
Number of species/sample	15 (7–36)	18 (11–34)	16 (7–36)

a *Poa trivialis* sub-community
b *Arrhenatherum elatius* sub-community
9 *Holcus lanatus-Deschampsia cespitosa* grassland (total)

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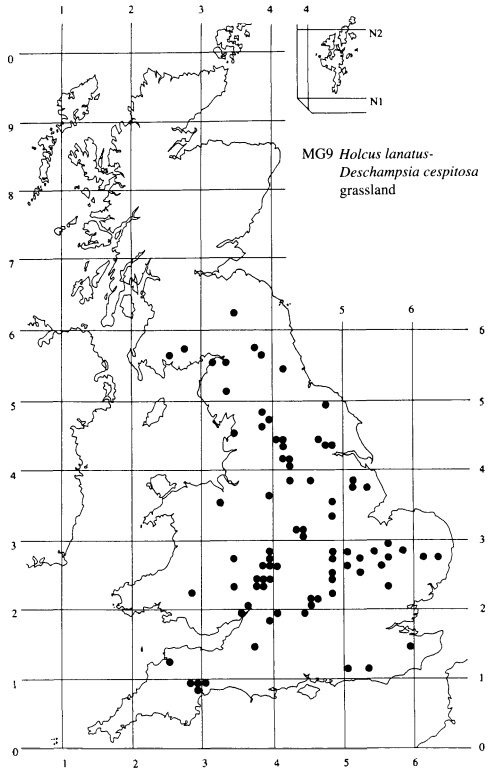

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