

MG10

Holcus lanatus-*Juncus effusus* rush-pasture

Holco-*Juncetum effusi* Page 1980

Synonymy

Juncetum effusi Tansley 1939 p.p.; *Senecioni-Juncetum acutiflori ranunculetosum acris* Br.-Bl. & R.Tx. 1951 p.p.; *Lolio-Cynosuretum lotetosum uliginosi* Sissingh & Tideman 1960 p.p.; *Juncus effusus* Group 1 vegetation Agnew 1961; *Ranunculus repens*-*Juncus effusus* community Birse & Robertson 1976 p.p.; Ordinary damp meadows Ratcliffe 1977.

Constant species

Agrostis stolonifera, *Holcus lanatus*, *Juncus effusus*, *Ranunculus repens*.

Physiognomy

The *Holco-Juncetum effusi* has a sward with prominent tussocks of *Juncus effusus* up to 80 cm tall in a generally species-poor and shorter grassy ground. *Holcus lanatus* and *Agrostis stolonifera* are the only constant grasses and each or both may be abundant. *Poa trivialis*, *Lolium perenne*, *Alopecurus geniculatus*, *A. pratensis* and *Festuca pratensis* are less frequent and usually much less abundant and other grasses occur but rarely. Sedges are generally uncommon throughout the community as a whole.

Dicotyledons are relatively few in number, although particular species may be conspicuous. *Ranunculus repens* and *R. acris* are frequent and sometimes abundant with generally smaller amounts of *Cardamine pratensis*, *Trifolium repens*, *Rumex acetosa*, *Plantago lanceolata*, *Potentilla anserina* and *Cerastium fontanum*. Taller Rumices, such as *R. crispus*, *R. obtusifolius* and *R. conglomeratus* are sometimes prominent. Poor-fen species such as *Lotus uliginosus*, *Stellaria alsine* and *Cirsium palustre* are never frequent.

Bryophytes are somewhat sparse, although *Calliergon cuspidatum* and *Eurhynchium praelongum* may attain abundance in some stands.

Sub-communities

Typical sub-community: *Holco-Juncetum effusi typicum*, variant *solitus* Page 1980. Here, *J. effusus* is always the

most prominent rush but otherwise the floristics are those of the community as a whole.

***Juncus inflexus* sub-community:** *Holco-Juncetum effusi typicum*, *Juncus inflexus* variant Page 1980. In this sub-community, *J. inflexus* partly or wholly replaces *J. effusus*, occurring as large isolated tussocks up to 1 m in diameter, with *J. effusus* generally as scattered shoots and small tussocks of low vitality. The vegetation is a little richer than in the Typical sub-community with *Carex hirta*, *Trifolium repens* and taller Rumices preferentially frequent.

***Iris pseudacorus* sub-community:** *Lolio-Cynosuretum juncetosum*, *Iris pseudacorus* variant O'Sullivan 1968b p.p.; *Holco-Juncetum effusi iridetosum* Page 1980. Here, *I. pseudacorus* is generally the most conspicuous species, attaining a height of up to 150 cm by mid-summer and sometimes dominating in dense patches. Where its leaves are grazed back in the autumn and the ground poached, there may be a temporary abundance of *H. lanatus*, *A. stolonifera*, *P. trivialis* and *Alopecurus pratensis* in the following spring before regrowth of the *I. pseudacorus* occurs but, within the denser clumps, species diversity is reduced and *J. effusus* is markedly less abundant. In more open and damp areas *Phalaris arundinacea* may be prominent with a sparse ground cover of *Glyceria fluitans*, *Alopecurus geniculatus*, *Myosotis scorpioides* and *Potentilla anserina*. *Filipendula ulmaria* may gain protection from grazing within the stands but it never co-dominates.

Habitat

The *Holco-Juncetum* is characteristic of permanently moist sites over a wide range of oligotrophic and mesotrophic mineral soils of varying pH throughout the British lowlands and on the upland fringes. It is generally grazed and is widely distributed in pastures but it is also common on abandoned agricultural land, on damp verges, in ditches and around pools and fens including dune slacks.

The most important condition for the maintenance of

the community is a consistently high soil moisture status. The *Holco-Juncetum* occurs on brown earths, brown calcareous earths and alluvial soils which are kept moist and sometimes waterlogged by ground or surface water. Such soils frequently show gleying in the surface horizons and may develop a humose topsoil, but the community is characteristically absent from true organic soils. In such circumstances, the *Holco-Juncetum* can occur over almost any impervious bedrock and over any pervious substratum where there is a drift cover.

The Typical and *Iris* sub-communities are most characteristic of less calcareous soils with a slightly acid or circumneutral pH, although the *Iris* sub-community seems to have a restricted distribution, being limited to the extreme west of England and Wales where it typically occurs on periodically flooded alluvium. The *Juncus inflexus* sub-community replaces the Typical sub-community on more calcareous soils and it is much more common towards the south-east of England.

Although *J. effusus* is eaten by cattle and rabbits (Richards & Clapham 1941b), it is a relatively unpalatable species and resistant to moderate trampling and the *Holco-Juncetum* will persist under even intensive grazing. There is some evidence that the tussock form of *J. effusus*, which predominates in this community, is a response to pasturing (Agnew 1961) and preferential grazing of the intervening sward certainly tends to accentuate the mosaic appearance of the vegetation. Where stands are ungrazed, and especially in wetter places, as around pool margins, *J. effusus* may become an uncompromising dominant in the community. Although cattle may occasionally develop a taste for *J. inflexus* (Salisbury 1964), it is generally more consis-

tently avoided than is *J. effusus* (Richards & Clapham 1941a) and, in the *J. inflexus* sub-community, its tussocks commonly grow very large. The other occasional dominant in the *Holco-Juncetum*, *I. pseudacorus*, is also generally left by cattle when there is a good bite available but plants are quickly grazed down to the rhizomes in the autumn when herbage is in short supply.

Zonation and succession

The community very commonly occurs in mosaics related to patterns of soil moisture. The Typical sub-community is very frequent as patches and sometimes as extensive stands in damper hollows in the *Lolio-Cynosuretum* and *Centaureo-Cynosuretum* and distinctive patterns often reflect the occurrence of ridge-and-furrow or drains that are too widely spaced, rushy strips picking out the wetter bands of soil. The *Juncus inflexus* sub-community is encountered in less well-drained areas within more calcareous soils in the *Alopecurus-Sanguisorba* flood-meadow and the more calcicolous types of *Centaureo-Cynosuretum*. The *Iris* sub-community occurs in often very prominent patches in alluvial *Lolio-Cynosuretum* in western river valleys. Where the water-table rises beside streams and pools, the *Holco-Juncetum* may form part of a complete or partial transition from grassland to swamp, fen or inundation communities. Here, as with the field mosaics, there may be a range of intermediate types of vegetation based on the abundance of the dominant Junci.

The *Holco-Juncetum* commonly develops by the invasion of *J. effusus* and *J. inflexus* into established or newly-seeded grasslands. A number of studies have demonstrated that *J. effusus* produces formidable quantities of seed (Chippindale & Milton 1934, Milton 1936, 1948, Moore & Burr 1948, Salisbury 1964) and that these are readily dispersed by wind, by animals and farm machinery after the seed-coat becomes mucilaginous,

Figure 10. Pastures and related rush-dominated communities in relation to soil variation.

NARDO-GALION	CYNOSURION	MESOBROMION	
U4 <i>Festuca-Agrostis-Galium</i> grassland	MG6 <i>Lolio-Cynosuretum</i> grassland	CG2 <i>Festuca-Avenula</i> grassland	free-draining soils
M23 <i>Juncus effusus/ acutiflorus-Galium palustre</i> rush-pasture	MG10 <i>Holco-Juncetum</i> rush-pasture	M22 <i>Juncus subnodulosus-Cirsium palustre</i> fen-meadow	impeded soils
transitional to JUNCTION ACUTIFLORI base-poor soils	CALTHION	transitional to JUNCO-MOLINION base-rich soils	

and by water (Richards & Clapham 1941*b*, Salisbury 1964). However, two conditions must be fulfilled for germination and survival of the seedlings: light and soil-surface humidity (Moore & Burr 1948, Lazenby 1955*a, b*, Agnew 1961). Successful invasion is therefore most readily achieved in a broken or badly-seeded sward where the soil surface does not dry out, conditions which are often met in over-grazed and poached pasture or on ill-drained land that is being put down to leys.

Once established, the *Holco-Juncetum* is not readily eradicated. Grazing alone will not reduce the cover of *J. effusus* or *J. inflexus* and both are relatively tolerant of mowing. Systematic drainage, re-seeding and fertilising probably convert the community to the *Lolium-Alopecurus-Festuca* flood-pasture or *Lolium-Cynosuretum* but careful pastoral management is necessary to prevent re-infestation. Ungrazed stands may be invaded by shrubs and trees tolerant of wet soils and eventually be converted to scrub and woodland.

Distribution

The *Holco-Juncetum* is ubiquitous throughout the British lowlands. The Typical sub-community is most frequent towards the north and west and the *Juncus inflexus* sub-community towards the south and east, although it occurs locally elsewhere on more calcareous ill-drained soils, as around dune-slack mires. The *Iris* sub-community has been recorded only from the South-West Peninsula, from Gower and from Anglesey.

Affinities

The community has long been recognised as an unproductive agricultural grassland, although it has not been fully described in the British literature. Two particular problems are involved in defining its affinities. First, it shows obvious similarities to the various Cynosurion grasslands from which it is often derived by invasion of

J. effusus and *J. inflexus* and which are frequently maintained as the matrix of the vegetation by grazing. Some authors (e.g. O'Sullivan 1965, 1968*b*) have recognised this by assigning very similar vegetation to that included here to sub-communities of Cynosurion swards. Clearly, the level of *Juncus* abundance that is taken as the boundary between such vegetation types and a distinct *Juncus* community of this kind must be somewhat arbitrary.

Second, the *Holco-Juncetum* has obvious close affinities with various types of mire vegetation, forming part of a series of rush-dominated communities occupying suitably moist soils through the lowlands of Britain and into the upland fringes, their composition reflecting interactions between edaphic and climatic conditions and treatment. Essentially, the *Holco-Juncetum* occupies the mesotrophic middle ground between the *Juncus-Cirsium* fen-meadow of base-rich peats and peaty gleys in the warmer south-east of the country, where *J. subnodulosus* is the most important dominant, and the *Juncus-Galium* rush-pasture, a community of ill-drained, base-poor soils in the wetter and cooler west and north, where *J. acutiflorus* becomes increasingly prominent (Figure 10). In general, the balance of more calcicolous and continental plants, as against more calcifuge and oceanic ones, will help define the intermediate swards of the *Holco-Juncetum*, but gradations extend in both directions. A further confusion arises with grazing-mediated transitions on richer soils to vegetation dominated by *Filipendula ulmaria*, when the community can be seen as grading into the *Filipendula-Angelica* mire.

Like the *Cynosurus-Caltha* grassland, the *Holco-Juncetum* can be seen as a member of the *Calthion palustris* which, towards the Atlantic coast of Britain, becomes increasingly ill-defined. Some Continental authorities have placed vegetation of this kind in a distinct sub-alliance, the *Holco-Juncion*.

Floristic table MG10

	a	b	c	10
<i>Juncus effusus</i>	V (2–8)	III (1–4)	IV (2–6)	V (1–8)
<i>Holcus lanatus</i>	V (3–8)	IV (4–7)	IV (3–7)	V (3–8)
<i>Agrostis stolonifera</i>	IV (3–9)	V (5–8)	IV (3–8)	IV (3–9)
<i>Ranunculus repens</i>	III (3–7)	V (3–5)	IV (3–6)	IV (3–7)
<i>Phleum pratense pratense</i>	I (2–5)			I (2–5)
<i>Angelica sylvestris</i>	I (2–4)			I (2–4)
<i>Carex panicea</i>	I (3–5)			I (3–5)
<i>Pulicaria dysenterica</i>	I (2–5)			I (2–5)
<i>Prunella vulgaris</i>	I (4)			I (4)
<i>Juncus articulatus</i>	I (3)			I (3)
<i>Juncus inflexus</i>		V (3–8)		II (3–8)
<i>Carex hirta</i>	I (4)	III (3–4)		I (3–4)
<i>Iris pseudacorus</i>			V (1–7)	II (1–7)
<i>Alopecurus pratensis</i>			II (2–6)	I (2–6)
<i>Filipendula ulmaria</i>	I (4)		II (2–4)	I (2–4)
<i>Phalaris arundinacea</i>	I (5)		II (3–7)	I (3–7)
<i>Lotus uliginosus</i>	I (5)	I (2)	II (3)	I (2–5)
<i>Glyceria fluitans</i>	I (3)	I (3)	II (2–5)	I (2–5)
<i>Myosotis scorpioides</i>	I (3)		II (2)	I (2–3)
<i>Urtica dioica</i>		I (2)	II (2–3)	I (2–3)
<i>Lychnis flos-cuculi</i>			I (3)	I (3)
<i>Poa trivialis</i>	III (2–5)	IV (4–6)	IV (2–5)	III (2–6)
<i>Cardamine pratensis</i>	II (1–4)	III (2–4)	III (1–3)	III (1–4)
<i>Ranunculus acris</i>	III (2–5)	III (3–4)	II (2)	III (2–5)
<i>Trifolium repens</i>	II (3–9)	III (2–3)	I (1)	II (1–9)
<i>Lolium perenne</i>	II (2–4)	II (3–4)	II (3–4)	II (2–4)
<i>Rumex crispus</i>	I (2–4)	III (3–4)	III (2–3)	II (2–4)
<i>Alopecurus geniculatus</i>	I (1–4)	II (3–4)	III (1–3)	II (1–4)
<i>Rumex acetosa</i>	II (2–4)	I (2)	II (3–4)	II (2–4)
<i>Festuca pratensis</i>	I (2–3)	II (2–4)	II (4–5)	II (2–5)
<i>Rumex obtusifolius</i>	I (3–4)	II (2–3)	I (2)	II (2–4)
<i>Plantago lanceolata</i>	I (2–4)	I (6)	II (1–3)	II (1–6)
<i>Potentilla anserina</i>	II (2–5)		II (1–3)	II (1–5)
<i>Cerastium fontanum</i>	II (3)	I (2)	I (3)	II (2–3)
<i>Cirsium arvense</i>	I (1)	II (3–4)	I (2–4)	I (1–4)
<i>Festuca rubra</i>	I (4–5)	II (3–5)		I (3–5)
<i>Rumex conglomeratus</i>	I (2–3)	II (3–6)		I (2–6)
<i>Calliargon cuspidatum</i>	I (5–6)	I (5)	I (3)	I (3–6)
<i>Equisetum arvense</i>	I (1–2)	I (4)	I (1)	I (1–4)
<i>Dactylis glomerata</i>	I (4–7)	I (5)	I (6)	I (4–7)
<i>Trifolium pratense</i>	I (4)	I (4)	I (2)	I (2–4)
<i>Polygonum hydropiper</i>	I (2)	I (4)	I (3)	I (2–4)
<i>Poa pratensis</i>	I (3–5)		I (1)	I (1–5)
<i>Anthoxanthum odoratum</i>	I (3)		I (2)	I (2–3)
<i>Caltha palustris</i>	I (2)		I (4)	I (2–4)

Floristic table MG10 (cont.)

	a	b	c	10
<i>Stellaria alsine</i>	I (3)		I (3)	I (3)
<i>Oenanthe crocata</i>	I (4)		I (3)	I (3–4)
<i>Eurhynchium praelongum</i>	I (3)		I (3)	I (3)
<i>Cynosurus cristatus</i>	I (1–6)	I (3–5)		I (1–6)
<i>Agrostis capillaris</i>	I (5–9)	I (5–6)		I (5–9)
<i>Taraxacum officinale</i> agg.	I (1–2)	I (4)		I (1–4)
<i>Plantago major</i>	I (2)	I (1)		I (1–2)
<i>Cirsium palustre</i>	I (3)	I (2)		I (2–3)
<i>Equisetum palustre</i>	I (1)	I (4)		I (1–4)
<i>Mentha aquatica</i>	I (2–3)	I (1)		I (1–3)
× <i>Festulolium loliaceum</i>	I (1)	I (3)		I (1–3)
<i>Vicia cracca</i>		I (3)	I (3)	I (3)
<i>Senecio aquaticus</i>		I (4)	I (3)	I (3–4)
Number of samples	17	15	8	40
Number of species/sample	12 (6–20)	15 (8–24)	13 (9–16)	13 (6–24)

- a Typical sub-community
b *Juncus inflexus* sub-community
c *Iris pseudacorus* sub-community
10 *Holco-Juncetum effusi* (total)



