S26
Phragmites australis-Urtica dioica tall-herb fen

Synonymy
Angelico-Phragmitetum typicum sensu Ratcliffe & Hattey 1982 *p.p.*

Constant species
Phragmites australis, *Urtica dioica*.

Physiognomy
The tall-herb fen vegetation included in this community is very variable in its floristics and physiognomy. Apart from the two constants, *Galium aparine* is the only species that is at all frequent throughout. Moreover, although both *Phragmites* and *U. dioica* are generally abundant and often dominant, the various sub-communities are marked by the characteristically patchy local prominence of a variety of other tall dicotyledons or monocotyledons, most notably *Epilobium hirsutum*, *Filipendula ulmaria*, *Oenanthe crocata*, *Calystegia sepium*, *Solanum dulcamara*, *Glyceria maxima*, *Arrhenatherum elatius* and, less frequently, *Carex riparia* or *Phalaris arundinacea*. These form a typically chequered canopy usually 1–2 m in height which is often dense and so tangled by climbers and sprawlers as to be virtually impenetrable.

Stands are frequently species-poor and, even in more open vegetation, associates are rather varied. There are sometimes scattered plants of species characteristic of richer fens, e.g. *Lythrum salicaria*, *Lysimachia vulgaris*, *Angelica sylvestris*, *Cirsium palustre*, *Iris pseudacorus* and *Rumex hydrolapathum* and, beneath these, occasional *Pulicaria dysenterica*, *Equisetum fluviatile*, *Scutellaria galericulata* and *Silene dioica*. In other cases, there may be a grassy understorey with *Poa trivialis*, *Holcus lanatus* and *Dactylis glomerata*. Sprawling *Galium palustre*, *Lotus uliginosus* and *Rubus fruticosus* agg. sometimes add to the tangle. Bryophytes are very sparse and there are very rarely any invading shrubs or trees.

Sub-communities

***Filipendula ulmaria* sub-community:** *Epilobium-Urtica-Galium-Filipendula* fen Haslam 1965; *Phragmites-Urtica* community Wheeler 1980*c*; *Angelico-Phragmitetum typicum sensu* Ratcliffe & Hattey 1982 *p.p.* In the often very tall, dense and species-poor vegetation of this sub-community either *Phragmites* or *U. dioica* or *F. ulmaria* can be dominant with, less frequently, a local abundance of *Eupatorium cannabinum*. Apart from *G. aparine*, no other species occurs with even occasional frequency.

***Arrhenatherum elatius* sub-community:** *Peucedano-Phragmitetum arrhenatheretosum* Wheeler 1980*a p.p.* *Phragmites* is usually dominant here with varying amounts of *U. dioica* and *G. aparine* and, beneath, tussocks of *Arrhenatherum elatius*. Scattered plants of *Cirsium arvense* and *Heracleum sphondylium* are very characteristic of this vegetation and there is occasionally a little *Calystegia sepium* and *Angelica sylvestris*.

***Oenanthe crocata* sub-community.** Again, *Phragmites* is normally dominant in this sub-community but there is generally only a little *U. dioica* and the most prominent associate is *Oenanthe crocata*, whose tall, robust shoots present a striking appearance among the reed. *Calystegia sepium*, *Vicia cracca* and, less frequently, *Lathyrus pratensis* and *Solanum dulcamara* climb among the vegetation and there are occasional scattered plants of both rich-fen tall herbs and species characteristic of disturbed and enriched habitats such as *Rumex crispus*, *Sonchus arvensis* and *Dipsacus fullonum*. Clumps of *Phalaris arundinacea* and tussocks of *Festuca arundinacea* can be locally abundant and there may be a patchy understorey with some *Elymus repens*, *Agrostis stolonifera*, *Carex otrubae* and *Potentilla anserina*.

https://doi.org/10.1017/9781107340817.056 Published online by Cambridge University Press

***Epilobium hirsutum* sub-community:** Primary *Glycerietum* and Primary *Phragmitetum* Lambert 1946 *p.p.*; *Epilobium-Urtica-Galium-Phragmites* fen Haslam 1965; *Peucedano-Phragmitetum typicum*, *Phalaris* variant Wheeler 1980*a p.p.*; *Epilobium-Filipendula* community Wheeler 1980*c p.p.*; *Angelico-Phragmitetum typicum sensu* Ratcliffe & Hattey 1982 *p.p. Phragmites* or, less frequently, *Glyceria maxima* or, rarely, *Carex riparia* is dominant here but *U. dioica* and, particularly distinctive, *Epilobium hirsutum* frequently occur in prominent patches. Where stands occur alongside woodland, *Solanum dulcamara* is sometimes abundant. There is occasionally a little *Galium aparine* and, by water margins, *Typha latifolia* may be found. Here too, scattered plants of smaller herbs can occur, e.g. *Mentha aquatica*, *Ranunculus repens*, *Myosotis scorpioides*, *Apium nodiflorum*.

Habitat

The *Phragmites-Urtica* fen is characteristic of eutrophic, circumneutral to basic water margins and mires where organic or mineral substrates are kept fairly moist throughout the year with ground-water gleying and, in some cases, winter flooding. It occurs as primary fen in some naturally more nutrient-rich open-water transitions and flood-plain mires, as along the Yare valley in Norfolk (Lambert 1946) and, particularly towards the south-west, it may form part of the richer reed-dominated vegetation that occurs above salt-marsh strandlines (Proctor 1980). Often, however, its distribution can be related to the eutrophication that may follow the drying and disturbance of fen surfaces or the contamination of ground waters by agricultural run-off, sewage or some industrial effluents. It is a common community in the moister parts of some drained and disturbed floodplain and valley mires (e.g. Haslam 1965, Ratcliffe & Hattey 1982) and may represent the only fen vegetation that survives in much-improved lowland agricultural landscapes. It also occurs occasionally on grossly disturbed spring mires (Haslam 1965, Wheeler 1980*c*). It is widely distributed, though often as fragmentary strips, along ditches and canals and around ponds. The community is generally unmown but it may be accessible to grazing stock, which provide further enrichment in their dung, and it is sometimes disturbed by ditch clearing and dredging.

The distinctive feature of the habitat seems to be a certain natural or artificial balance between soil moisture and trophic state. Conditions are generally sufficiently moist for *Phragmites* to retain an overall prominence but the substrate is sufficiently dry at certain times of the year to allow nutrient-demanding perennial dicotyledons such as *U. dioica* and *E. hirsutum* to gain a hold and spread vegetatively into dense patches. There is some evidence to suggest (Haslam 1965) that, provided moisture levels are not too high, the ability of such species to compete with *Phragmites* is increased with the greater availability of nutrients, especially perhaps of phosphate, and that, where conditions remain fairly eutrophic, they may also have the edge in drier situations. Where a suitability is roughly maintained between extremes of these variables, the characteristic tall-herb mixtures of the community seem to represent a fairly balanced state with little or no mutual suppression by the various co-dominants (Haslam 1971*b*).

On the flood-plains of the Yare as described by Lambert (1946), a natural stability of this kind was typical of some of the primary fen subject to irrigation with nutrient-rich waters circulating freely in response to tidal influence, although here the situation was complicated by the ability of *G. maxima* to compete with *Phragmites* in vegetation classified in this scheme in the *Epilobium* sub-community. Much of this kind of fen has now been overgrown by shrubs and trees. Elsewhere, the *Filipendula* sub-community probably represents the most natural kind of *Phragmites-Urtica* fen occurring in some less disturbed valley mires, like certain Breck fens (Haslam 1965), or in mire remnants which remain moist but where there has not been excessive eutrophication. The *Oenanthe* sub-community too may represent a natural floristic response to the enrichment by strandline detritus that occurs on upper salt-marshes flushed with fresh water, as along the Exe estuary (Proctor 1980).

In many cases, though, the balance of wetness and enrichment characteristic of the habitat has had an artificial origin. The eutrophication of lowland ground waters is now very widespread and the virtually ubiquitous distribution of the *Epilobium* sub-community throughout the agricultural lowlands and in some wet sites in derelict urban and industrial areas is one reflection of this. In other cases, it is the drainage and disturbance of mires with oxidation of organic matter and release of nutrients that marks the occurrence of the *Phragmites-Urtica* fen, especially again the *Epilobium* sub-community. In her study of Breck mires, Haslam (1965) showed how these processes could increase the trophic state of valley mire substrates and, even on the deep and oligotrophic peats of spring mires, bring about a similar encouragement of *U. dioica* and *E. hirsutum* to that obtained by the addition of NPK and PK fertilisers. In the valley mires, *Phragmites*, the natural fen dominant, was able to survive some lowering of the water-table and persist alongside these species in mixed tall-herb fens which sometimes marked old mowing marsh.

Zonation and succession

The community frequently occurs in open-water transitions and flood-plain and valley mires in association with other types of fen and passing, on wetter ground, to

various kinds of swamp. Stands are sometimes extensive and may occur as a definite zone as in some of the Yare fens described by Lambert (1946) where a belt of the *Epilobium* sub-community, dominated by *G. maxima* or, less frequently, by *P. australis*, graded to the *Glycerietum maximae* alongside open water. In other cases, the community may pass to the *Phragmitetum australis* or the *Caricetum paniculatae* (e.g. Haslam 1965 in the Breck valley fens) or occur with the *Caricetum ripariae* (as in some of the Pembrokeshire valley and flood-plain mires: Ratcliffe & Hattey 1982). Very often, however, stands are fragmentary and form a patchy mosaic with richer fens of the *Peucedano-Phragmitetum* (in Broadland) or the *Phragmites-Eupatorium* community, on wetter and/or less disturbed ground, and tall-herb vegetation dominated by *E. hirsutum* or *U. dioica* in drier and/or more disturbed places. Stands of *Alnus glutinosa-Urtica dioica* or *Alnus-Carex paniculata* woodlands can occur with these patchworks and the *Phragmites-Urtica* fen is sometimes found in disturbed clearings within these woodlands. In mire remnants which have been grazed, the community may pass to fen meadow vegetation on drier ground.

In eutrophicated and disturbed spring mires, zonations are often sharp, small stands of the community occurring alongside ditches or within *Schoeno-Juncetum* or grazed fen-meadow (Haslam 1965). By ditches and water-courses in agricultural land, too, patches or strips of the *Phragmites-Urtica* fen may be abruptly marked off from adjacent farmland, although here and in urban wetlands, the community can occur in fragmentary mosaics with tall-herb and weed vegetation where there is much disturbance.

Where the *Oenanthe* sub-community occurs on the upper salt-marsh, it has been observed to pass sharply to the *Atriplici-Elymetum pycnanthi* moving downshore (Proctor 1980).

Only in a few situations where waters are naturally eutrophic does the *Phragmites-Urtica* fen seem to be a primary vegetation type developed as part of a hydrarch succession. In most cases, it seems to be a secondary community which partly or wholly replaces richer fens in response to artificial enrichment and disturbance. Its dense cover does not appear easily open to the invasion of woody species but continued natural drying of the fen surface or drainage and subsequent abandonment may lead to the development of tall-herb vegetation without *Phragmites* which itself may represent a fairly stable phase in a deflected succession (Haslam 1965).

Distribution

The community occurs throughout the lowlands but is particularly well represented in Broadland, the Fens and around the Shropshire and Cheshire meres. The *Epilobium* sub-community is by far the commonest type of *Phragmites-Urtica* fen; the *Filipendula* sub-community has a scattered distribution but seems rather rare. The *Arrhenatherum* sub-community and particularly the *Oenanthe* sub-community have both been encountered most frequently in south-west England and south Wales. *O. crocata* has an Oceanic West European distribution (Matthews 1955) and is also an occasional species in undisturbed salt-marsh reed-beds on the west coast.

Affinities

The *Phragmites-Urtica* fen has obvious affinities with both the richer fens of the Magnocaricion and with the tall-herb communities of the Artemisietea and some Continental schemes have included vegetation of the latter type rich in fen species within the Galio-Convolvuletalia (=Galio-Alliarietalia), e.g. the *Eupatorietum cannabini* R.Tx. 1937. There are also some similarities between the *Filipendula* sub-community and Filipendulion vegetation. Here, the prominence of *Phragmites* throughout the community and the close developmental relationship between this vegetation and more natural fens argue in favour of retaining the *Phragmites-Urtica* community within the Magnocaricion.

Floristic table S26

	a	b
Phragmites australis	V (7–10)	V (5–10)
Urtica dioica	V (3–7)	IV (3–7)
Galium aparine	V (1–4)	IV (1–6)
Filipendula ulmaria	V (3–8)	II (4–6)
Eupatorium cannabium	II (3–7)	
Cirsium arvense	I (3–4)	IV (1–5)
Arrhenatherum elatius	I (1)	IV (1–7)
Heracleum sphondylium	I (1)	III (1–5)
Oenanthe crocata	I (5)	
Calystegia sepium		II (3–5)
Vicia cracca		I (3)
Stachys palustris		I (1)
Elymus repens		I (4)
Rumex crispus		I (3)
Agrostis stolonifera		
Phalaris arundinacea		
Lathyrus pratensis		
Sonchus arvensis		
Potentilla anserina		
Festuca arundinacea		
Dipsacus fullonum		
Carex otrubae		
Epilobium hirsutum	I (4)	I (4)
Solanum dulcamara		
Glyceria maxima		
Typha latifolia		
Sparganium erectum		
Juncus subnodulosus		
Myosotis scorpioides		

https://doi.org/10.1017/9781107340817.056 Published online by Cambridge University Press

c	d	26
V (7–10)	V (1–10)	V (1–10)
V (1–10)	IV (1–7)	IV (1–10)
III (1–3)	II (1–5)	III (1–6)
III (1–3)	I (1–7)	II (1–8)
	I (1–3)	I (1–7)
III (3–4)	I (1–4)	II (1–5)
I (2)	I (4)	I (1–7)
I (3)		I (1–5)
V (3–5)		I (3–5)
IV (2–5)	I (1–6)	I (1–6)
III (1–4)	I (1)	I (1–4)
III (2–5)		I (1–5)
II (2–3)	I (3)	I (2–4)
II (3–4)	I (1–5)	I (1–5)
II (3–4)	I (4)	I (3–4)
II (2–7)	I (1–6)	I (1–7)
II (2–4)	I (1)	I (1–4)
II (4–5)		I (4–5)
II (4–5)		I (4–5)
II (4–6)		I (4–6)
II (2–3)		I (2–3)
II (2)		I (2)
I (3)	IV (1–8)	III (1–8)
II (2–3)	III (1–5)	II (1–5)
	III (3–10)	II (3–10)
	II (1–3)	I (1–3)
	I (1–4)	I (1–4)
	I (1)	I (1)
	I (1–3)	I (1–3)

https://doi.org/10.1017/9781107340817.056 Published online by Cambridge University Press

Mentha aquatica		
Ranunculus repens		
Ranunculus acris		
Apium nodiflorum		
Glechoma hederacea		
Carex acuta		
Juncus effusus		
Angelica sylvestris	I (1)	II (1–4)
Lythrum salicaria	I (1–3)	I (3–4)
Pulicaria dysenterica	I (2)	I (3)
Silene dioica	I (2–3)	I (3)
Carex riparia	I (5)	I (1–4)
Holcus lanatus	I (4)	I (3–5)
Galium palustre	I (4)	
Equisetum fluviatile	I (3)	
Rubus fruticosus agg.	I (3–4)	I (3–6)
Cirsium palustre		I (1)
Iris pseudacorus		I (1–4)
Scutellaria galericulata		I (4)
Lotus uliginosus		I (1–2)
Poa trivialis		I (4)
Brachythecium rutabulum		I (5)
Rumex hydrolapathum		I (6)
Galium uliginosum		I (1)
Lysimachia vulgaris		I (5)
Equisetum palustre		I (1)
Dactylis glomerata		I (4–5)
Lychnis flos-cuculi		
Valeriana officinalis		
Lycopus europaeus		
Eurhynchium praelongum		

https://doi.org/10.1017/9781107340817.056 Published online by Cambridge University Press

	I (1–5)	I (1–5)
	I (2–3)	I (2–3)
	I (1–2)	I (1–2)
	I (2–4)	I (2–4)
	I (2–3)	I (2–3)
	I (1)	I (1)
	I (1)	I (1)
II (1–3)	I (1–5)	I (1–5)
II (3)	I (1–4)	I (1–4)
I (3)	I (5)	I (2–5)
II (3)		I (2–3)
	I (1–10)	I (1–10)
	I (3)	I (3–5)
II (2–4)	I (1–6)	I (1–6)
	I (1–3)	I (1–3)
		I (3–6)
II (2–3)	I (1–4)	I (1–4)
II (2)	I (1–7)	I (1–7)
II (3–5)	I (1–3)	I (1–5)
I (3)	I (1–4)	I (1–4)
I (3)	I (1–4)	I (1–4)
I (4)	I (1)	I (1–5)
I (4)	I (1–3)	I (1–6)
	I (1)	I (1)
	I (1–2)	I (1–5)
	I (1–3)	I (1–3)
I (2)		I (2–5)
I (3)	I (1)	I (1–3)
I (3)	I (1)	I (1–3)
I (4)	I (1–3)	I (1–4)
I (3)	I (3–5)	I (3–5)

https://doi.org/10.1017/9781107340817.056 Published online by Cambridge University Press

Floristic table S26 (*cont.*)

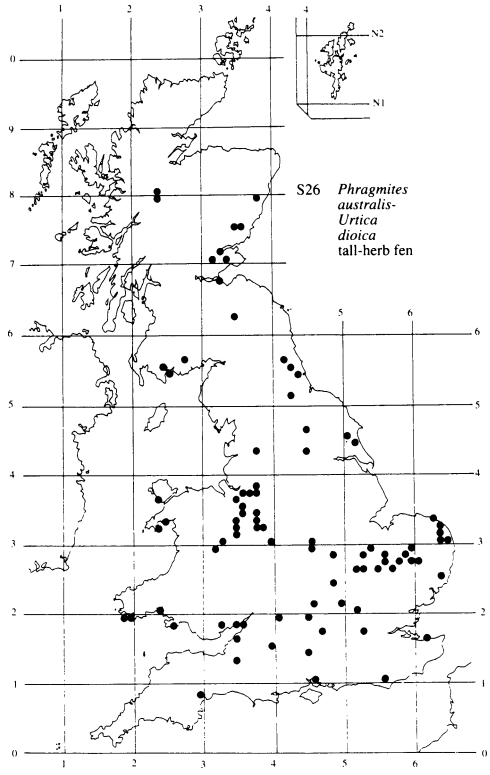
	a	b
Number of samples	10	10
Number of species/sample	6 (4–12)	10 (5–15)
Vegetation height (cm)	156 (80–300)	132 (60–200)
Vegetation cover (%)	100	100

a *Filipendula ulmaria* sub-community
b *Arrhenatherum elatius* sub-community
c *Oenanthe crocata* sub-community
d *Epilobium hirsutum* sub-community
26 *Phragmites australis-Urtica dioica* tall-herb fen (total)

https://doi.org/10.1017/9781107340817.056 Published online by Cambridge University Press

c	d	26
8	64	92
15 (9–22)	8 (2–22)	9 (2–22)
122 (65–200)	121 (50–225)	126 (50–300)
96 (90–100)	98 (80–100)	98 (80–100)

https://doi.org/10.1017/9781107340817.056 Published online by Cambridge University Press



https://doi.org/10.1017/9781107340817.056 Published online by Cambridge University Press