A18
Ranunculus fluitans community
Ranunculetum fluitantis Allorge 1922

Synonymy
Moderate-moderately swift current vegetation Butcher 1933.

Constant species
Ranunculus fluitans.

Physiognomy
The *Ranunculetum fluitantis* comprises stands of submerged vegetation dominated by clumps of *Ranunculus fluitans*, sometimes numerous and close-set, in other cases few and sparse. It is generally a perennial plant, with individuals often long-lived though highly plastic in their morphology with just a few shoots, fairly short, in less congenial situations, but growing much more bushy and very long, up to 6 m, where conditions are more favourable, with the fine capillary foliage trailing downstream. Rarely, it can be found in an annual terrestrial form, with much-condensed shoots growing on moist ground (Cook 1966, Holmes 1979, Rich & Rich 1988). It is winter-green, with quite large populations of shoots persisting from one year to the next, but attains its maximum size early in the summer (Haslam 1978).

Few other plants occur with any frequency or abundance in denser stands, but there is sometimes a little *Myriophyllum spicatum*, *M. alterniflorum* or *Potamogeton perfoliatus* with patches of the mosses *Fontinalis antipyretica* or *F. squamosa* growing on submerged stones. *Elodea canadensis*, *Lemna minor* or *L. gibba* may occur in slacker waters, and there can be shoots of plants like *Glyceria fluitans* and *Mentha aquatica* trailing in from the margins.

Habitat
The *Ranunculetum fluitantis* is most characteristic of bigger moving waters, often with quite swift flow, and stable, stony beds, usually only moderately fertile and not very base-rich. It is virtually confined to England where it occurs most commonly in faster lowland streams and wide but not too spatey, rivers in the upland fringes.

R. fluitans needs considerable water movement to maintain good growth, and deeper channels, often of 1 m or more, are favoured (Haslam 1978). It will occasionally colonise sluggish waters in larger dykes and drains, though it rarely flowers in such situations (Holmes 1979), and it is very easily eroded from finer, soft substrates. It is much more frequent on consolidated beds, with gravel or pebbles, sometimes larger stones or boulders, and here it can gain a much firmer hold. The long, flexuose shoots, growing in streamlined clumps, offer little resistance to turbulence, and *R. fluitans* can extend into quite fast-flowing waters. It will persist even in torrents as sparse shoots but will not tolerate very spatey conditions, so in hill steams tends to be best developed in wider places where the bed is more stable. Towards the lowlands, the favoured, firmer substrates are usually concentrated in medium-width stretches of rivers (Haslam 1978).

Even in southern Britain, though, to which pure *R. fluitans* seems to be restricted (Holmes 1979), this vegetation is not usually found in more calcareous or eutrophic waters, being most typical of mesotrophic to quite oligotrophic and sometimes fairly base-poor conditions, extending into streams on impoverished and acidic rocks around the Welsh Marches, the Pennines and the Lake District (Haslam 1978). The faster flow and stony substrates help maintain the favourable environment, and eutrophication of rivers by draining in of enriched ground waters or effluents is inimical to *R. fluitans*.

Zonation and succession
The *Ranunculetum fluitantis* can sometimes monopolise the vegetated stretches in faster, stony-bedded rivers but it is often found in mosaics with other aquatic communities where there is variation in turbulence and depth of the waters and the character of the substrate, and gives way to other assemblages with a shift in these factors downstream and up.

Where the flow becomes a little slacker and the bed finer, this kind of vegetation can be found with stands of *Elodea canadensis* and, where the waters are less base-poor, the *Potamogeton-M. spicatum* community, and these may replace the *Ranunculetum fluitantis* where lower river catchments are dominated by shales or clays. In highly eutrophic steams, *Potamogeton pectinatus* stands can take over from the community. Floating-leaved stands of *Potamogeton natans* or *Polygonum amphibium* may occur and in the shallows there can be a zone of Glycerio-Sparganion vegetation or patches of the *Phalaridetum*.

These often persist along the margins of moving waters upstream of the major *Ranunculetum fluitantis* stretches where the submerged vegetation tends to comprise mixtures of *Callitriche stagnalis* stands, sometimes with the *Ranunculetum aquatilis* or, in more base-poor streams, the *Potamogeton-M. alterniflorum* or *M. alterniflorum* communities.

Distribution

The community is concentrated in northern and central England, with more local sites further south, along the Welsh Marches and just beyond the Scottish border.

Affinities

R. fluitans has generally been recorded in accounts of British vegetation as part of more broadly-defined assemblages of moving waters (e.g. Butcher 1933, Tansley 1939) but our stands are clearly comparable with the *Ranunculetum fluitantis* described from northern France (Allorge 1921–2), The Netherlands (Westhoff & den Held 1969) and Germany (Oberdorfer 1977) and placed in the Callitricho-Batrachion (or Ranunculion fluitantis as Ellenberg (1978) has it).

Floristic table A18

Ranunculus fluitans	V (4–9)
Myriophyllum spicatum	II (4–5)
Glyceria fluitans	I (1)
Elodea canadensis	I (4)
Lemna minor	I (5)
Fontinalis antipyretica	I (5)
Potamogeton perfoliatus	I (6)
Fontinalis squamosa	I (6)
Myriophyllum alterniflorum	I (1)
Mentha aquatica	I (2)
Phalaris arundinacea	I (2)
Lemna gibba	I (1)
Number of samples	8
Number of species/sample	2 (1-4)

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