A10
Polygonum amphibium community

Synonymy
Floating-leaved vegetation West 1910, Tansley 1911; *Polygonum amphibium* sociation Spence 1964; *Polygonum amphibium* Gesellschaft Oberdorfer 1977; *Polygonum amphibium* Community Birse 1980.

Constant species
Polygonum amphibium.

Rare species
Juncus filiformis.

Physiognomy
Polygonum amphibium is a far-creeping rhizomatous perennial that occurs occasionally in a variety of swamps and mires, and even in some quite dry habitats, but which can assume local dominance in water and around its margins in this *Polygonum* community. Growing in an aquatic state, the plants are usually rooted in the banks or shores, with shoots trailing through the water for up to 75 cm or so, the long-petioled leaves floating on the surface. Where the waters fluctuate, quite a common feature where this species grows, stands can be found exposed, with the shoots lying unsupported on the ground, and the vegetation can survive considerable periods like this before resubmergence. Indeed, if such water margins are freshly colonised by *P. amphibium*, the plants can be found in the strikingly different terrestrial form, erect, little branched and with sessile or very shortly stalked leaves (Lousley & Kent 1981), and pure stands of such individuals are obviously indistinguishable floristically from those growing under water.

Although aquatic *P. amphibium* vegetation is quite often found in close association with a variety of other floating and floating-leaved communities, dense stands frequently have few other species intermixed with them. There is occasionally some *Nuphar lutea* or *Nymphaea alba*, *Potamogeton natans* or *Lemna minor*, and sometimes trailing shoots of *Glyceria fluitans* or *Callitriche stagnalis* can be found. Beneath, there can be sparse plants of *Potamogeton obtusifolius*, *P. perfoliatus* or *P. gramineus* and a little *Elodea canadensis*, or an open sward of *Littorella uniflora*, or occasionally emergent *Equisetum fluviatile*. The rare Northern Montane rush *Juncus filiformis* occurs in great abundance in this kind of vegetation at its locality in County Durham (Graham 1988), where it is an introduction, perhaps brought in by birds (Perring & Farrell 1977).

Habitat
The *Polygonum* community is characteristic of the surrounds and shallows of standing to generally slow-moving, sometimes fluctuating, waters, often base-poor and usually only moderately nutrient-rich. It occurs widely through most of the British lowlands and upland fringes, in and around pools, lakes and reservoirs, dykes and canals, streams and rivers, and periodically wet flood-plain hollows.

P. amphibium is one of those rather few plants that are truly amphibious, growing perfectly well on land, but able to continue assimilating under water, provided the leaves can reach the surface, which they can do in depths of up to 1 m or so. To some extent, therefore, it is indifferent to water depth, and unusually well adapted among British plants that can grow aquatically to surviving quite marked and frequent fluctuations in water-level. It is often found, then, around the margins and over the exposed shores of reservoirs which are drawn down and refilled at intervals, and in the periodically flooded embayments and hollows on the alluvial terraces of more mature rivers, and over detritus on the beds of younger streams which experience some spates. But it is equally common in permanent aquatic habitats and, with its plants generally anchored in the banks rather than over the bottom, it can grow abundantly even around the edges of steep-sided water bodies like deep dykes and ponds, or behind earth dams.

The rhizomes are rooted deeply in the substrate so the shoots break rather than get pulled out where the large

leaves offer resistance to faster flow, but regrowth occurs very readily and the plants can stand periodic damaging spates (Haslam 1978). Typically, though, this is a community of standing or sluggish waters, avoiding those streams where there is a swift normal flow: this is reflected in its concentration in the lowlands.

P. amphibium will grow on a wide variety of substrates, including peat and fine gravel, and, with adventitious roots growing from the nodes, any shoots exposed or thrown up can quickly anchor again in all but the coarsest or firmly packed material. With floating leaves, it will also stand very turbid conditions, such as are frequent where silts and clays are stirred up by turbulence or fluctuations in level. Although it can make luxuriant growth in such situations, *P. amphibium* does not seem to be demanding of very eutrophic substrates or waters and, indeed, tends to be absent from pools and dykes markedly enriched by pollution. It perhaps avoids limy waters but occurs widely in streams, lakes and reservoirs with catchments of quite impoverished rocks and soils.

Zonation and succession

The *Polygonum* community occurs in its more permanent aquatic habitats with a variety of other free-floating and floating-leaved vegetation, and sometimes with an abundant submerged element. Emergents or water-margin plants often grow through stands in their colonisation of more shallow open waters and, provided the cover is not too densely shading, patches of *P. amphibium* can remain among these into quite advanced states of terrestrialisation. Periodically flooded ground with this kind of vegetation usually has mosaics or zonations with a variety of inundation communities.

Sometimes, the *Polygonum* community is the only kind of floating-leaved vegetation in open waters, particularly where banks drop sharply to some depth or where there is marked fluctuation. Often, though, it occurs with stands of the *Nymphaeetum* or the *Nuphar* or *Potamogeton natans* communities and, where there is a gentle increase in depth, these can grow much further out than *P. amphibium* and may form an extensive zone beyond it. In other cases, small patches of all these vegetation types can occur in more intimate and fragmentary disposition, as in many small pools, and canals, or along the length of dykes and river margins. Stands of the *Lemnetum minoris* frequently persist among the *Polygonum* community, and these two types of vegetation may be among the first to return in any abundance after periodic spates.

Stiller waters, particularly those that are somewhat more eutrophic, can have *Elodea canadensis* vegetation beneath the *Polygonum* community or sometimes the *Potamogeton pectinatus-Myriophyllum spicatum* vegetation, while around the margins of lakes towards the north and west there can be a sparse *Littorella-Lobelia* sward over the substrate.

In these latter situations, the *Polygonum* community can be found as an element in vegetation patterns which do not seem to be subject to any but the slowest of successions (Spence 1964), and it can persist in more open stands of swamps like the *Caricetum rostratae*, the *Caricetum vesicariae*, the *Equisetetum fluviatilis* and the *Scirpetum lacustris* where these have colonised shallower open water, and remain in patches in marginal *Potentillo-Caricetum* fen rafts.

In the lowlands, and particularly in more mesotrophic water bodies with mineral substrates, seral processes can proceed much more quickly if the dykes or pools are not kept open. Here, the *Polygonum* community can be found beyond or within advancing emergent vegetation like the *Glycerietum maximae*, the *Caricetum ripariae*, the *Typhetum angustifoliae*, the *Typhetum latifoliae* and the *Sparganietum erecti*, eventually being shaded out in dense stands. It also often occurs around water margins with various types of Glycerio-Sparganion vegetation and this kind of association is characteristic, too, of some periodically wet habitats like flood-plain pools or seasonally wet lowland streams. At the limit of gleying around such places, there can be a zone of the *Phalaridetum*.

Particularly distinctive of situations that are inundated from time to time are patchworks of the *Polygonum* community, occupying the wettest areas, with various kinds of Bidention vegetation disposed over moist silts and sands around, species such as *Bidens tripartita*, *Polygonum lapathifolium*, *P. mite* and *P. hydropiper* often assuming local dominance in virtually pure stands of one or other species. These in turn can be surrounded by a zone of Elymo-Rumicion vegetation, like the *Festuca-Agrostis-Potentilla* community which can grade in virtually continuous fashion to unflooded pasture on higher ground.

Distribution

The *Polygonum* community occurs widely in suitable habitats throughout the British lowlands, becoming rarer towards the north of Scotland.

Affinities

Very little reference has been made to the contribution of *P. amphibium* to aquatic vegetation, apart from its inclusion in broadly defined assemblages of floating-leaved plants (West 1910, Tansley 1911) and the very occasional listing of species-poor stands (Spence 1964, Birse 1980). The *Polygonum* community subsumes the vegetation dominated by *P. amphibium* and is synonymous with aquatic societies defined in mainland Europe (Oberdorfer 1977) and traditionally placed among other floating-leaved communities in the Nymphaeion.

Further sampling may characterise a richer kind of water-margin vegetation with *P. amphibium*, together with species like *Eleocharis palustris*, *Rorippa amphibium*, *Polygonum hydropiper* and *Bidens tripartita*, among *Glyceria fluitans*, *G. plicata*, *Veronica beccabunga* and *Nasturtium officinale*, which Westhoff & den Held (1969) included within a Glycerio-Sparganion association.

Floristic table A10

Polygonum amphibium	V (7–10)
Nuphar lutea	II (4–5)
Potamogeton natans	II (4–7)
Lemna minor	II (1–2)
Glyceria fluitans	II (2–4)
Callitriche stagnalis	II (1–2)
Equisetum fluviatile	II (1–3)
Potamogeton gramineus	I (1–3)
Elodea canadensis	I (1–3)
Potamogeton obtusifolius	I (1-3)
Littorella uniflora	I (1–2)
Potamogeton perfoliatus	I (1–3)
Nymphaea alba	I (1)
Juncus filiformis	I (4)
Number of samples	37
Number of species/sample	4 (1–10)

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