W7
Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum woodland

Synonymy
Alder woodland types 1b, 1c *p.p.* & 2b *p.p.* McVean 1956*b*; *Pellio-Alnetum* Klötzli 1970 *p.p.*; *Crepis paludosa-Alnus glutinosa* Association Birse 1980; Alder stand types 7Aa, 7Ab, 7Bc, 7D & 7Eb Peterken 1981; Woodland plot types 12, 13, 14 & 16 Bunce 1982.

Constant species
Alnus glutinosa, *Filipendula ulmaria*, *Lysimachia nemorum*, *Eurhynchium praelongum*.

Physiognomy
The *Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum* woodland typically has a somewhat open and, in slope-flush stands, rather irregular canopy of trees. *Alnus glutinosa* is the only woody constant throughout and, on more secure substrates, it can reach a grand stature with multiple stems and numerous small suckers and be an overwhelming dominant. Very frequently, however, there is some *Fraxinus excelsior* in the canopy and, rather less commonly, some *Betula pubescens* (only rarely *B. pendula*) and both of these can attain prominence in a more mixed cover of trees. *Acer pseudoplatanus* occurs occasionally where the ground is not permanently moist. Sometimes, larger specimens of *Salix cinerea* and *S. caprea* break the main canopy tier. Although edaphic conditions here are often suitable for *Q. robur*, this is predominantly a north-western woodland type and the species is rather scarce. *Q. petraea* can occur occasionally, though it is very much limited to the less strongly gleyed soils of the *Deschampsia* subcommunity. Slumping flushes carrying this woodland are sometimes overhung by trees rooted in the drier ground of the surrounding woodland.

There is usually an understorey in this community but its cover, height and composition are rather variable. *Corylus avellana*, *Crataegus monogyna* and *Salix cinerea* are the most frequent species overall and each can be abundant but the first two tend to be very poorly represented on periodically-flooded alluvial flats and confined to more stable and drier areas in slope flushes; *S. cinerea*, by contrast, is commoner in wetter situations. *Sorbus aucuparia* and *Sambucus nigra* occur occasionally, the former tending to follow *Corylus* and *Crataegus*, the latter more often associated with *S. cinerea*. Other species that may be encountered are *Ilex aquifolium*, *Viburnum opulus*, *Prunus spinosa* and *P. padus*, the last sometimes with striking local abundance. Saplings of the main canopy trees are common with young *Fraxinus* and *A. pseudoplatanus* being especially frequent and abundant, *Alnus* and *Betula* rather less so. Where there is a tall tier of trees, these smaller woody elements may form a quite well defined understorey; in other stands, the layers tend to merge indistinctly.

The field layer here is somewhat variable with only two constant species, but the community has a number of associates which are frequent throughout and its general features are quite distinctive. The most consistent component is a low-growing cover of herbaceous dicotyledons and grasses, among which *Lysimachia nemorum*, *Ranunculus repens*, *Poa trivialis* and *Holcus mollis* are the commonest species. Scattered through this ground are frequent plants of *Filipendula ulmaria* and *Athyrium filix-femina* and, in the different sub-communites, this tall-herb and fern component is considerably enriched, so that a layered structure develops in the herbaceous vegetation. Often, though, this physiognomy is masked by the prominence of bulkier monocotyledons: *Juncus effusus* is very frequent in some subcommunities (essentially where there is strong gleying, rather than flooding) and it can be quite abundant; in other stands, *Carex remota* or, less commonly, *C. pendula* or *C. laevigata* occur in quantity. *C. paniculata* and *C. acutiformis*, however, are rare here, a good separation between this community and some similar kinds of *Alnus-Carex* woodland. And *Molinia caerulea* is likewise very uncommon which helps distinguish this vegetation from soligenous *Betula-Molinia* woodland. Finally, except in the wettest stands, there is frequently some *Rubus fruticosus* agg., though only on flush surrounds does it thicken up to form an underscrub.

Bryophyte cover in the community is somewhat

patchy but *Eurhynchium praelongum* and *Plagiomnium undulatum* are both very frequent and, in various of the sub-communities, *Lophocolea bidentata s.l.*, *Thuidium tamariscinum*, *Rhizomnium punctatum* and *Brachythecium rutabulum* occur occasionally with, in wetter stands, *B. rivulare* and *Chiloscyphus polyanthos* and, in drier situations, *Mnium hornum* and *Atrichum undulatum*. *Pellia epiphylla*, which Klötzli (1970) used to name this kind of woodland in Britain, is no more than occasional. Sphagna are characteristically rare.

Sub-communities

***Urtica dioica* sub-community:** Alder woodland type 1c McVean 1956*b p.p.*; *Pellio-Alnetum* Klötzli 1970 *p.p.*; Alder stand types 7Ab & 7Bc Peterken 1981 *p.p.*; Woodland plot types 13 & 14 Bunce 1982 *p.p.* The canopy here is almost invariably dominated by *Alnus* with frequent and sometimes abundant *Fraxinus* but rather less *Betula pubescens* than is usual in the community. *Acer pseudoplatanus* is slightly preferential and can make very good growth in situations that are not too wet. Very occasionally, there is some *Salix fragilis* or *S. caprea*. The understorey is rather patchy but generally sparse and both *Corylus* and *Crataegus* are markedly uncommon, the usual cover being provided by scattered bushes of *Salix cinerea* and, preferential here, *Sambucus nigra*. Saplings are frequent, with *A. pseudoplatanus* being especially well represented, *Alnus* and *Fraxinus* more occasionally.

Among the smaller herbs of the field layer, *Chrysosplenium oppositifolium* is especially distinctive here and, where there is much water trickling over the surface, it can form extensive carpets or continuous strips in the narrow winding channels that carry flush waters down from nearby slopes. *C. alternifolium* can occur, too, though much less frequently and typically on the more stagnant areas between the channels. Occasionally, there may be some *Caltha palustris* in the moving waters and *Cardamine amara* along the channel banks and when all these are flowering in early spring before the tall-herb cover has fully grown up, they can give stands a very striking patterned appearance. In other cases, as on moist alluvium or colluvium, *Allium ursinum* may provide a distinctive vernal cover.

Later in the season, the ground is typically covered with a carpet of *C. oppositifolium* with *Ranunculus repens*, *Poa trivialis*, *Lysimachia nemorum* and, in drier places, *Holcus mollis*. Above this, among the scattered crowns of *Athyrium* and clumps of *Filipendula*, *Angelica sylvestris* is preferential and, even more distinctive here, *Urtica dioica*, which is sometimes present as scattered shoots but often as a patchily dense cover, among which there are thick sprawls of *Galium aparine*. *Rubus fruticosus* agg. is quite frequent but usually not abundant, especially where the ground is very wet. In some stands, the tall-herb cover is enriched by clumps of *Phalaris arundinacea* or, less commonly but sometimes with local abundance and giving a distinctly Atlantic feel, *Oenanthe crocata*. In other places, *Impatiens glandulifera* has become prominent in this kind of woodland. In somewhat drier situations but with some base-enrichment, herbs such as *Mercurialis perennis*, *Geum urbanum*, *Geranium robertianum* and *Circaea lutetiana* can occur. *C.* × *intermedia* can also occur sparsely where flushing produces bare patches of sloppy ground.

Bryophyte cover is patchy in this sub-community, though sometimes quite extensive, with *Brachythecium rutabulum* (and, in wetter places, *B. rivulare*) frequently joining *Eurhynchium praelongum* and *Plagiomnium undulatum* to form lush wefts over bare soil and the bases of the herb stools. Quite commonly, after winter-flooding, there are patches of newly-deposited silt.

***Carex remota-Cirsium palustre* sub-community:** Alder woodland type 2b McVean 1956*b p.p.*; *Pellio-Alnetum* Klötzli 1970 *p.p.*; *Crepis paludosa-Alnus glutinosa* Association Birse 1980 *p.p*; Alder stand types 7Bc, 7D & 7Eb Peterken 1981 *p.p.* *Alnus* is again the usual dominant in this sub-community but *Fraxinus* and *B. pubescens* are both quite frequent and, in the typically small and irregular stands developed over slumping slope flushes, the canopy can be very uneven-topped and rather open. In the gaps, *Salix cinerea* can attain a considerable size so that stratification becomes indistinct. Overall, this is the commonest of the smaller woody species but both *Corylus* and *Crataegus* become quite frequent here, rooted in patches of drier and more stable ground. *Ilex aquifolium* can also sometimes be found and *Prunus padus*, though not very common, can be locally abundant. Then there are scattered saplings of *Alnus*, *Fraxinus* and *B. pubescens*, but rarely of *A. pseudoplatanus* which is typically absent from the canopy here. Where the substrate is especially unstable, displaced or leaning trees and shrubs are frequent and much of the woody cover may then be provided by plants rooted on the drier surrounds to the flush.

Among the smaller herbs, *Ranunculus repens* remains very frequent here and with the community species, *Lysimachia nemorum*, it can form extensive ground carpets. *Chrysosplenium oppositifolium* occurs occasionally, too, though not with the consistently high frequency or abundance characteristic of the last sub-community. *Mentha aquatica* and *Ajuga reptans* are preferential among this element of the vegetation, though neither is very common. The tall-herb element is more distinctive: *Urtica* occurs only rarely but *Filipendula* is frequently joined here by *Cirsium palustre*, *Valeriana officinalis*, *Crepis paludosa* and, more occasionally, *Lychnis flos-cuculi*, *Eupatorium cannabinum* and *Succisa pratensis*.

Diverse and luxuriant mixtures of these species form a

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background to the patchy dominance of a variety of bulky monocotyledons. *Juncus effusus* (rarely *J. acutiflorus*) is frequent and it can be abundant, but more peculiar to this sub-community is the common occurrence of large amounts of *Carex remota*. Sometimes this is accompanied or replaced by *C. laevigata* or *C. pendula*, the last quite often with *Equisetum telmateia* and some small patches of *Cratoneuron commutatum* on weak tufa, producing a very striking kind of vegetation that, with further sampling, could warrant recognition as a separate type of *Fraxinus-Alnus-Lysimachia* woodland. *Phalaris* and *Oenanthe crocata* occur rarely but sometimes with an abundance that lends a distinctive physiognomy. *Rubus* is very infrequent and typically has very sparse cover.

Bryophytes can form an important element of this vegetation though their cover is very variable and much dependent on the exposure of more open patches of slipping moist soil. In such situations, *Brachythecium rivulare* frequently joins *Eurhynchium praelongum* and *Plagiomnium undulatum* and each of these can be abundant; less commonly, there is some *Calliergon cuspidatum*, *Chiloscyphus polyanthos*, *Pellia epiphylla* and *Cirriphyllum piliferum* in addition to the community occasionals *Thuidium tamariscinum* and *Rhizomnium punctatum*. Rarely, there may be small tufts of less exacting Sphagna such as *S. palustre*, *S. recurvum* or *S. squarrosum* but these do not attain the prominence typical of certain similar kinds of *Betula-Molinia* woodland.

***Deschampsia cespitosa* sub-community:** Alder woodland type 1b McVean 1956*b p.p.*; *Pellio-Alnetum* Klötzli 1970 *p.p.*; *Crepis paludosa-Alnus glutinosa* Association Birse 1980 *p.p.*; Alder stand types 7Aa, 7Ab, 7D & 7E Peterken 1981 *p.p.*; Woodland plot type 16 Bunce 1982. The canopy in this vegetation, which often occurs as a transition from flushes to the surrounding woodland, is a little more varied than elsewhere in the community. *Alnus* has reduced frequency and quite commonly shares dominance with, not only *Fraxinus* and *B. pubescens*, but sometimes oak (generally *Q. petraea*) and occasionally *A. pseudoplatanus* and *Ulmus glabra* or large specimens of *Sorbus aucuparia*. The understorey is frequently well defined and quite extensive, with *Corylus* and *Crataegus* being often joined by *S. aucuparia* and, more rarely, by *Ilex*, *Prunus spinosa*, *P. padus* and *Viburnum opulus*. *Salix cinerea*, though, is much scarcer than in the other two sub-communities. Saplings are common with frequent young *Fraxinus, B. pubescens* and *A. pseudoplatanus* and, more occasionally, oaks and *Ulmus*; *Alnus* saplings, however, are rare.

Smaller dicotyledons are still prominent in the field layer but the species involved are somewhat different from those in the other kinds of *Alnus-Fraxinus-Lysimachia* woodland. *Lysimachia* remains frequent but both *Ranunculus repens* and *Chrysosplenium oppositifolium* are very uncommon here and their place is taken by *Oxalis acetosella* (which can form extensive carpets), *Viola riviniana*, *Veronica montana*, *Potentilla sterilis*, *Fragaria vesca* and, occasionally in more southerly stands, *Lamiastrum galeobdolon*. Sometimes, too, there is a patchy cover of *Hedera helix*. Scattered through this ground are some tall herbs, though this component is generally not prominent here: only *Filipendula* is common and plants such as *Stachys sylvatica*, *Digitalis purpurea*, *Stellaria holostea* and *Teucrium scorodonia*, though preferential, are at most occasional.

More obvious and distinctive elements of the vegetation are provided by grasses and ferns. *Deschampsia cespitosa* is strongly preferential here and it can be very abundant, together with *Holcus mollis* and (somewhat reduced in frequency in this sub-community) *Poa trivialis*. Drier areas, especially where there is grazing, a common feature in the woodlands in which these flushes occur, may have some *Anthoxanthum odoratum* or *Agrostis capillaris* and, in more base-rich areas, there can be *Brachypodium sylvaticum*. Among the ferns, *Athyrium* is commonly accompanied by *Dryopteris dilatata* and, less frequently by *D. filix-mas* or *D. borreri*. Rarely, a few sparse fronds of *Pteridium aquilinum* can be seen.

As in the *Carex-Cirsium* sub-community, *Juncus effusus* occurs frequently and sometimes in abundance but, in contrast to that vegetation type, there is often also a dense tangle of *Rubus*.

Bryophyte cover is again rather variable but it can be high and some distinctive species are involved. Along with *Eurhynchium praelongum* and *Plagiomnium undulatum*, *Mnium hornum* becomes a constant feature on twiggy litter and around tree bases and fern stools and there is frequently some *Atrichum undulatum* on exposed soil. *Plagiothecium denticulatum* and *Isopterygium elegans* occur more rarely.

Habitat

The *Alnus-Fraxinus-Lysimachia* woodland is typical of moist to very wet mineral soils, only moderately base-rich and usually only mesotrophic, in the wetter parts of Britain. Some stands are grazed and some have undoubtedly been a source of coppice-wood, mostly of alder, in the past.

The community takes much of its general floristic character from the fact that it occupies wetter mineral soils in which there is no great tendency for the accumulation of either fen peat, over which it is usually replaced by the *Alnus-Carex* woodland, or more acidic organic matter, where the *Betula-Molinia* woodland is typical, a feature recognised in the intermediate position accorded

to this kind of vegetation in the scheme of alder woodlands proposed by McVean (1956*b*). In fact, the *Alnus-Fraxinus-Lysimachia* woodland can closely approach both of these other communities in its floristics, resembling the *Alnus-Carex* woodland in the *Urtica* and *Carex-Cirsium* sub-communities, and the *Betula-Molinia* woodland in the *Carex-Cirsium* and *Deschampsia* sub-communities; and the relationships of these various woodland types to the base-status and calcium content of the soils is probably quite delicate. In general, though, the *Alnus-Fraxinus-Lysimachia* woodland is marked off from the alder woodlands of fen peat by the scarcity here of *Carex paniculata* and *C. acutiformis* and the relative poverty of the tall-herb element; and it differs from the *Betula-Molinia* woodland in the rarity of *Molinia caerulea* and even the less exacting Sphagna. But the presence of some of the larger field-layer dominants, such as *Urtica dioica*, *Carex remota* and *Juncus effusus*, beneath canopies with much *Alnus* and *B. pubescens* can easily give a misleading first impression.

Typically, then, the *Alnus-Fraxinus-Lysimachia* woodland is found on various kinds of moister brown soils, such as brown alluvial soils, stagnogleyic brown earths or stagnogleys proper. Usually the superficial pH lies between 5 and 6, the combination of only moderate base-richness and high soil moisture being well marked by such herbs as *Athyrium filix-femina*, *Ranunculus repens*, *Juncus effusus* and *Chrysosplenium oppositifolium* and the liverwort *Pellia epiphylla*. Although the local influence of somewhat more base-rich waters seeping from limy partings or calcareous drift can allow the sporadic appearance of such plants as *Mercurialis*, *Geum urbanum* and *Circaea lutetiana*, drier patches of soil can show quite marked surface leaching, an indication of the generally high rainfall experienced by most sites: by and large, this is a community of those parts of Britain which have more than 800 mm annual rainfall (*Climatological Atlas* 1952). The more equable character of the climate in such regions is well indicated by the occasional presence of plants such as *Carex laevigata* and *Oenanthe crocata*.

Within these areas, the community is often associated with situations where there is some topogenous or soligenous movement of minerotrophic waters, though it can also occur where impervious substrates maintain a perched water-table on gentle slopes or plateaus. And the different sub-communities show fairly clear relationships with the extent of the waterlogging and the nature of the water supply and its movement. The *Urtica* sub-community is most typical of often light-textured brown alluvial soils over the flat or gently-sloping terraces of young river systems cut into arenaceous or argillaceous rocks, sometimes running up on to colluvium that has washed down from neighbouring flushed slopes. Such soils are generally free-draining but they are kept moist throughout the year by the high water-table of the streams alongside which they occur or by constant flushing from above; and, on lower terraces, there may be some surface flooding in winter. Small depressions or areas receiving flush waters may remain permanently very wet; other raised patches can dry out somewhat in summer, when the soil surface shows a good, crumbly mull structure: such small-scale edaphic patterning is often reflected in the mosaic-like character of the field layer.

Also of importance here is the fact that the soils are quite eutrophic, and maintained in a moderately enriched state by the repeated deposition of allochthonous mineral material in flooding or flushing. *Urtica dioica* and *Galium aparine* show luxuriant growth and a rapid turnover of their remains: very little standing dead material persists in this vegetation until the start of the next growing season and, in early spring, the ground is often decidedly bare. The leaves of *Alnus* itself, which can attain grand stature here, are also rich in minerals and decay rapidly. Large woody nodules with nitrogen-fixing bacteria can also often be seen on *Alnus* roots exposed along the sides of small channels. Generally, however, conditions are not so enriched as to favour the development of the *Alnus-Urtica* woodland, though this community can often be found on more eutrophic terraces further downstream in the same river systems.

The *Carex-Cirsium* sub-community, in contrast to the *Urtica* sub-community, is very much a woodland of soligenous, minerotrophic flushes, being especially associated with springs or seepage lines where ground water emerges at impervious strata on shedding slopes, as where shaley partings occur within grits or sandstones or where such pervious deposits give way below to clays. The soils in such situations are kept permanently wet and, though they can be quite well structured below, on steeper slopes they approach undifferentiated sloppy masses of silt, clay and small rock fragments washed down by the trickling waters. The size and shape of the stand and the sharpness of its boundary are very much a reflection of the physical character of the flush. Where there is strong flushing over incompetent substrates, there can be massive slumping under this kind of woodland which produces a more open and unstable vegetation cover, often sharply marked off from the surrounding vegetation on firmer ground. Smaller and less vigorous flushes, whose waters percolate slowly over gentle slopes of stronger rocks, can have less well defined stands, grading with the neighbouring vegetation.

It is in such transitional situations that the *Deschampsia* sub-community is often found, over brown earths that show sometimes strong signs of gleying. But this kind of *Alnus-Fraxinus-Lysimachia* woodland is also characteristic of other situations where moderately base-rich soils are kept moist by drainage impedence, as,

for example, over level-bedded argillaceous bedrocks or where there are smears of heavy-textured superficials over gentle slopes or flat ground. In both of these situations, the vegetation approaches the less calcifugous oak-birch woodlands, the *Quercus-Pteridium-Rubus* woodland towards the south-east, the *Quercus-Betula-Oxalis* woodland to the north-west, more commonly the latter since this kind of alder woodland is largely a community of the upland fringes. However, the reasonably high frequency of *Alnus* here and the abundance of such species as *Juncus effusus* and *Deschampsia cespitosa* provide a good separation. Like many of the north-western oak-birch woodlands, the *Deschampsia* sub-community is often grazed, usually by sheep and/or deer which can readily reach the firmer ground around flushes, and this helps favour the prominence of grasses.

Zonation and succession

Typically, this community occurs as fairly small stands within more extensive stretches of other kinds of woodland, marking out sites where a strong influence of ground water interrupts vegetation patterns determined in large measure by variations in the base-richness of the soils.

The most frequent context for the *Carex-Cirsium* sub-community is some kind of less calcifugous oak-birch woodland clothing the surrounding slopes of arenaceous or argillaceous bedrocks or fairly light-textured drift with more freely draining brown earths. Where the interruption of drainage of the ground water is very slight or localised, as where thin shaley partings occur within sandstone sequences or where superficials become more clayey, the flush woodland may form no more than a small (though often repeated) variation in a more or less uniform woodland cover. In other cases, the patterning is more pronounced, as where there are more vigorous flushes or where very young river valleys have cut through shales, where the concave slope above the outer swing of every meander can have an undercut, slumping flush occupied by the *Carex-Cirsium* sub-community, alternating with drier oak-birch woodland on the intervening bluffs. Some very good examples of this last kind of pattern can be seen in the Carboniferous sediments of the Pennines and in Northumberland. The particular kind of oak-birch woodland involved in such zonations depends on the regional locality of the flush. Over much of the range of the *Alnus-Fraxinus-Lysimachia* woodland, it is the north-western *Quercus-Betula-Oxalis* woodland, as in the Lake District, the northern Pennines and Scotland. Further south, it is the *Quercus-Pteridium-Rubus* woodland, often in the southern Pennines and Wales the *Acer-Oxalis* sub-community, in the occasional Wealden localities the *Anemone* or Typical sub-communities (Figure 18).

A quite frequent complication of this general pattern is produced where the impervious substrate giving rise to the flushing is more calcareous than the pervious deposit above. Then, the *Carex-Cirsium* sub-community can straddle the junction between two kinds of woodland, the flush biting back into the more calcifugous vegetation above and spilling down on to the more calcicolous cover below. This is very well seen in those Wealden woods where flushing occurs at the junction of the Hythe Beds above, carrying *Quercus-Pteridium-Rubus* woodland and the Atherfield Clay and Weald Clay below, with *Fraxinus-Acer-Mercurialis* woodland. A similar zonation occurs further north where more calcareous shales interrupt sequences of less calcareous grits, though where there is flushing with markedly base-rich waters in the north-west, the *Alnus-Fraxinus-Lysimachia* woodland is generally replaced by wetter kinds of *Fraxinus-Sorbus-Mercurialis* woodland.

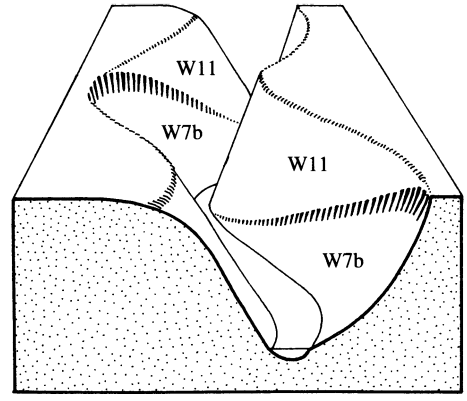
In all these situations, the *Deschampsia* sub-community can be found in association with the *Carex-Cirsium* sub-community as a transition to the woodland on drier soils around. However, it frequently occurs without the *Carex-Cirsium* sub-community, marking out strongly-gleyed patches with the *Quercus-Pteridium-Rubus* and *Quercus-Betula-Oxalis* woodlands on less well drained gentle slopes and plateaus or where there is a switch to more heavy-textured drift. It can also spread along rides and paths within these woodlands where trampling consolidates heavy-textured soils. To the north-west, transitions between the *Deschampsia* sub-community and the surrounding woodland, which are already often very gentle, can be further blurred by grazing throughout.

The *Urtica* sub-community is often found in the same kinds of woodlands as the two other sub-communities and, where flush waters drain down through colluvium and on to stream-side flats, it can occur in close association within them, all three forming a complex suite. In other cases, it occurs alone on alluvium, passing more sharply to the woodland on the drier valley sides.

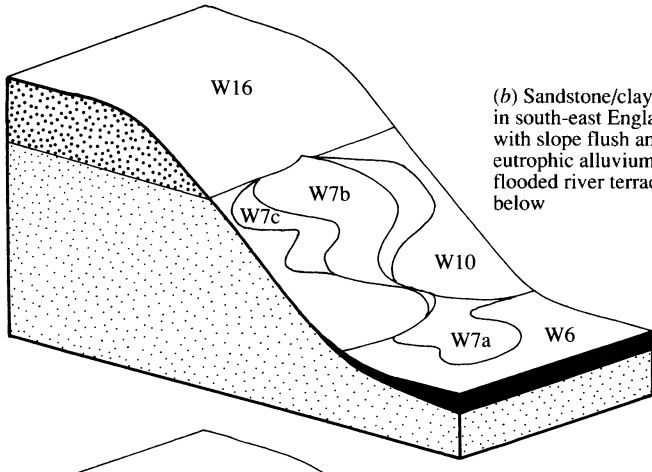
Where there is some variation in canopy cover, a frequent natural feature in less stable stands of the *Carex-Cirsium* sub-community, but also found where timber has been cleared, the *Alnus-Fraxinus-Lysimachia* woodland can form mosaics with Filipendulion tall-herb vegetation. Where the *Urtica* sub-community is opened up with some disturbance, patches of nitrophilous tall-herb vegetation are often found and clearance of the *Deschampsia* sub-community can result in a spread of *Rubus-Holcus* underscrub and the *Deschampsia-Holcus* grassland. Where clearance has been more extensive, the site of the woodland may be marked only by a small patch of flushed herbaceous vegetation in a stretch of improved grassland.

In general terms, it is probably some kind of Filipendulion vegetation which forms the natural precursor to

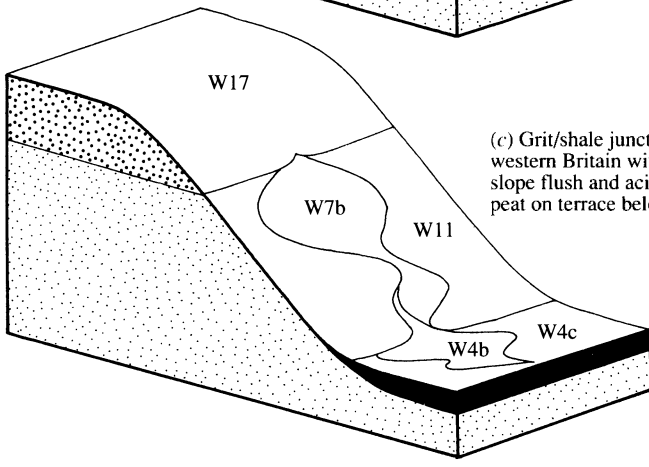
Figure 18. Different topographies and vegetation patterns with *Alnus-Fraxinus-Lysimachia* woodland.
W4b *Betula-Molinia* woodland, *Juncus* sub-community
W4c *Betula-Molinia* woodland, *Sphagnum* sub-community
W7a *Alnus-Fraxinus-Lysimachia* woodland, *Urtica* sub-community
W7b *Alnus-Fraxinus-Lysimachia* woodland, *Carex-Cirsium* sub-community
W7c *Alnus-Fraxinus-Lysimachia* woodland, *Deschampsia* sub-community
W10 *Quercus-Pteridium-Rubus* woodland
W11 *Quercus-Betula-Oxalis* woodland
W16 *Quercus-Betula-Deschampsia* woodland
W17 *Quercus-Betula-Dicranum* woodland



(*a*) Valley cut through shales in the upland fringes of north-west Britain with well-drained brows and slumping undercut hollows



(*b*) Sandstone/clay junction in south-east England with slope flush and eutrophic alluvium on flooded river terrace below



(*c*) Grit/shale junction in western Britain with slope flush and acidic peat on terrace below

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the *Alnus-Fraxinus-Lysimachia* woodland, though succession has never been followed in detail. With continued flushing and gleying, the community can probably persist as a more or less permanent feature but, with increased drying of the soil, as, for example, on upbuilding alluvium beneath the *Urtica* sub-community, progression to the *Quercus-Pteridium-Rubus* or *Quercus-Betula-Oxalis* woodland might be expected, with a decline in nitrophilous herbs and *Alnus*, a spread of *Rubus* and an invasion of oak, *Hyacinthoides* and *Pteridium*.

Distribution

The community is widely, though locally, distributed throughout the upland fringes of the north and west, with outlying occurrences in the wetter parts of southern England, notably the Weald.

Affinities

Apart from the fragmentary accounts provided by McVean (1956*b*) and Klötzli (1970), the detailed but partial definition of Birse (1980) and the appearance of this community within a number of alder woodland stand types in Peterken (1981), the *Alnus-Fraxinus-Lysimachia* woodland has not figured prominently in descriptions of British woodlands, alder-rich stands of this kind often being subsumed under general headings such as 'damp oakwood' (e.g. Tansley 1939). However, despite its floristically intermediate character, in relation to such factors as base-richness, soil moisture and trophic state (e.g. McVean 1956*b*), it is a well-defined woodland type occupying a very distinctive suite of habitats.

Moreover, it has a very clear counterpart indeed, among the woodlands of mainland Europe, in the *Carici remotae-Fraxinetum* Koch 1926 and its various emendations. This community has been described from exactly comparable situations, sometimes showing very similar suites of sub-communities to those recognised here: from Germany and Austria (Oberdorfer 1953, 1957), France (Noirfalise 1952), Belgium (Dethioux 1955), The Netherlands (Westhoff & den Held 1969), Czechoslovakia (Neuhäuslova-Novotna 1977) and Poland (Matuszkiewicz 1981). Stands towards the north-west of Europe are distinctive in the presence of species such as *Carex laevigata* and *Oenanthe crocata* and, in northern Britain, *Crepis paludosa* adds a Continental Northern feel. With the *Fraxinus-Sorbus-Mercurialis* woodland of more base-rich wet mineral soils, the *Alnus-Fraxinus-Lysimachia* woodland represents the Alno-Ulmion in Britain.

Floristic table W7

	a	b	c	7
Alnus glutinosa	V (4–10)	V (1–10)	III (1–10)	IV (1–10)
Fraxinus excelsior	III (1–7)	II (1–6)	III (1–7)	III (1–7)
Betula pubescens	I (2–4)	II (2–10)	II (1–6)	II (1–10)
Salix caprea	I (1–3)	I (1)	I (1–4)	I (1–4)
Quercus robur	I (2)	I (2–6)	I (1–4)	I (1–6)
Acer pseudoplatanus	II (1–5)		II (1–5)	II (1–5)
Betula pendula	I (1–7)		I (1–8)	I (1–8)
Salix cinerea		II (1–9)	I (2–5)	I (1–9)
Quercus hybrids		I (1–4)	I (2–5)	I (1–5)
Betula hybrids		I (2–6)	I (5)	I (2–6)
Salix pentandra		I (1–6)		I (1–6)
Quercus petraea		I (1–4)	III (1–9)	II (1–9)
Ulmus glabra			I (1–4)	I (1–4)
Crataegus monogyna	I (1–4)	III (1–6)	III (1–5)	II (1–6)
Corylus avellana	I (1–7)	II (1–7)	III (3–8)	II (1–8)
Fraxinus excelsior sapling	II (2–8)	II (1–4)	II (2–5)	II (1–8)
Salix cinerea	II (1–6)	II (1–8)	I (1–4)	II (1–8)
Alnus glutinosa sapling	II (3–6)	II (1–4)	I (2–6)	II (1–6)
Betula pubescens sapling	I (2)	II (1–7)	II (1–7)	II (1–7)
Ilex aquifolium	I (1)	II (1–4)	I (1–4)	I (1–4)
Viburnum opulus	I (1)	I (1–3)	I (1–2)	I (1–3)

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Prunus spinosa	I (1)	I (1–4)	I (1–3)	I (1–4)
Prunus padus		I (1–4)	I (2–5)	I (1–5)
Quercus robur sapling		I (1–3)	I (1–4)	I (1–4)
Betula hybrids sapling		I (1–2)		I (1–2)
Acer pseudoplatanus sapling	III (1–4)	I (1–3)	III (1–5)	II (1–5)
Sambucus nigra	II (1–4)	I (1–2)	I (1–2)	I (1–4)
Sorbus aucuparia	I (2–3)	I (1–4)	III (1–4)	II (1–4)
Ulmus glabra sapling			I (1–4)	I (1–4)
Quercus petraea sapling			I (1–2)	I (1–2)
Quercus hybrids sapling			I (2–5)	I (2–5)
Filipendula ulmaria	III (1–7)	IV (1–8)	III (1–7)	IV (1–8)
Lysimachia nemorum	II (1–3)	IV (1–5)	III (2–6)	IV (1–6)
Eurhynchium praelongum	III (2–7)	III (1–5)	IV (1–5)	IV (1–7)
Ranunculus repens	IV (1–8)	IV (1–5)	I (1–7)	III (1–8)
Chrysosplenium oppositifolium	IV (2–8)	II (1–6)	I (1–8)	II (1–8)
Urtica dioica	IV (1–8)	I (2–4)	I (1–2)	II (1–8)
Galium aparine	III (1–7)	I (1–3)	I (1–2)	II (1–7)
Angelica sylvestris	III (1–3)	II (1–6)	I (3)	II (1–6)
Brachythecium rutabulum	III (1–4)		I (1–5)	I (1–5)
Phalaris arundinacea	II (1–7)	I (2–6)		I (1–7)
Cirsium palustre	I (4)	III (1–4)	I (1–3)	II (1–4)
Brachythecium rivulare	II (1–5)	III (1–6)	I (1–4)	II (1–6)
Valeriana officinalis		III (1–4)	I (1–3)	II (1–4)
Carex remota		III (1–8)	I (1–6)	II (1–8)
Chiloscyphus polyanthos	I (2–4)	II (1–3)	I (1–4)	I (1–4)
Mentha aquatica	I (1)	II (1–4)		I (1–4)
Crepis paludosa		II (2–6)	I (1–4)	I (1–6)
Ajuga reptans		II (1–4)	I (1–3)	I (1–4)
Carex laevigata		II (1–7)	I (3)	I (1–7)
Calliergon cuspidatum		II (1–5)	I (1–3)	I (1–5)
Carex pendula		II (1–7)		I (1–7)
Eupatorium cannabinum		I (2–5)		I (2–5)
Juncus acutiflorus		I (1–6)		I (1–6)
Lychnis flos-cuculi		I (1–4)		I (1–4)
Succisa pratensis		I (1–2)		I (1–2)
Tussilago farfara		I (2–3)		I (2–3)
Cratoneuron commutatum		I (2–4)		I (2–4)
Achillea ptarmica		I (4–6)		I (4–6)
Cardamine pratensis		I (1–3)		I (1–3)
Carex nigra		I (1–2)		I (1–2)
Deschampsia cespitosa	I (1–5)	II (1–5)	IV (1–9)	III (1–9)
Mnium hornum	I (2–5)	II (1–4)	IV (1–7)	III (1–7)
Dryopteris dilatata	I (1–4)	II (1–3)	IV (1–6)	III (1–6)
Oxalis acetosella		II (1–7)	III (1–7)	II (1–7)
Atrichum undulatum		I (1–5)	III (1–4)	II (1–5)
Agrostis capillaris		I (3)	II (1–6)	I (1–6)
Viola riviniana		I (1–3)	II (1–4)	I (1–4)
Anthoxanthum odoratum		I (1–2)	II (1–5)	I (1–5)

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Floristic table W7 *(cont.)*

	a	b	c	7
Hedera helix	I (1–4)		II (1–6)	I (1–6)
Dryopteris borreri	I (1)		II (1–6)	I (1–6)
Veronica montana	I (2)		II (1–3)	I (1–3)
Plagiothecium denticulatum	I (1–3)		II (1–3)	I (1–3)
Stachys sylvatica	I (1–6)		II (1–3)	I (1–6)
Potentilla sterilis			II (1–5)	I (1–5)
Brachypodium sylvaticum			II (1–9)	I (1–9)
Fragaria vesca			II (1–3)	I (1–3)
Dryopteris filix-mas			II (1–6)	I (1–6)
Digitalis purpurea			I (1–3)	I (1–3)
Galium saxatile			I (1–4)	I (1–4)
Isopterygium elegans			I (1–3)	I (1–3)
Pteridium aquilinum			I (1–4)	I (1–4)
Teucrium scorodonia			I (1–3)	I (1–3)
Stellaria holostea			I (2–6)	I (2–6)
Conopodium majus			I (1–5)	I (1–5)
Lamiastrum galeobdolon			I (3–4)	I (3–4)
Primula vulgaris			I (1–2)	I (1–2)
Athyrium filix-femina	III (1–4)	III (1–4)	III (1–6)	III (1–6)
Holcus mollis	III (1–7)	II (2–5)	III (2–8)	III (1–8)
Poa trivialis	III (1–7)	III (1–6)	II (1–3)	III (1–7)
Plagiomnium undulatum	II (1–4)	III (1–6)	III (1–4)	III (1–6)
Juncus effusus	I (1–4)	III (1–6)	III (1–9)	III (1–9)
Rubus fruticosus agg.	III (1–4)	I (1–4)	III (1–8)	II (1–8)
Cardamine flexuosa	II (1–4)	II (1–4)	I (1–3)	II (1–4)
Caltha palustris	II (3–7)	II (1–6)	I (6)	II (1–7)
Lophocolea bidentata s.l.	II (2–3)	I (1–2)	II (1–3)	II (1–3)
Galium palustre	I (3)	II (1–5)	I (1–3)	I (1–5)
Holcus lanatus	I (1–5)	II (1–7)	I (1–4)	I (1–7)
Lonicera periclymenum	I (1–4)	II (1–3)	II (1–6)	II (1–6)
Circaea lutetiana	II (1–3)		II (1–4)	II (1–4)
Pellia epiphylla		II (2–5)	II (1–5)	II (1–5)
Thuidium tamariscinum		II (1–4)	II (1–5)	II (1–5)
Rumex acetosa		II (1–4)	II (2–4)	I (1–4)
Rhizomnium punctatum		II (1–4)	II (1–4)	I (1–4)
Stellaria alsine	II (1–3)	I (2–4)	I (3)	I (1–4)
Geranium robertianum	II (1–4)	I (1–2)	I (1–5)	I (1–5)
Mercurialis perennis	II (1–5)	I (1–2)	I (1–6)	I (1–6)
Ranunculus ficaria	II (3–5)	I (1–4)	I (3–4)	I (1–5)
Hyacinthoides non-scripta	I (1–6)	I (1–2)	I (1–4)	I (1–6)
Equisetum sylvaticum	I (3–6)	I (1–5)	I (2)	I (1–6)
Ranunculus acris	I (3)	I (1–4)	I (1–4)	I (1–4)
Dactylis glomerata	I (1–6)	I (2–3)	I (1–3)	I (1–6)
Rosa canina agg.	I (1)	I (2–3)	I (1–3)	I (1–3)
Cirriphyllum piliferum	I (1–5)	I (1–6)	I (1–3)	I (1–6)
Glechoma hederacea	I (1–3)		I (1–2)	I (1–3)
Geum urbanum	I (1–2)		I (1–2)	I (1–2)

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Silene dioica	I (1–4)		I (1–2)	I (1–4)
Iris pseudacorus	I (2–5)	I (3–7)		I (2–7)
Oenanthe crocata	I (1–6)	I (1–6)		I (1–6)
Cardamine amara	I (2–7)	I (5)		I (2–7)
Equisetum telmateia	I (5)	I (7–10)		I (5–10)
Equisetum arvense		I (1–3)	I (1)	I (1–3)
Geum rivale		I (2–4)	I (1–3)	I (1–4)
Viola palustris		I (1–5)	I (4)	I (1–5)
Eurhynchium striatum		I (1–2)	I (1–5)	I (1–5)
Eurhynchium swartzii		I (1–2)	I (1–2)	I (1–2)
Agrostis canina canina		I (1–8)	I (1–2)	I (1–8)
Plagiothecium succulentum		I (1–2)	I (1–2)	I (1–2)
Plagiochila asplenoides		I (1–3)	I (1)	I (1–3)
Fraxinus excelsior seedling		I (1–2)	I (1–3)	I (1–3)
Polytrichum commune		I (1–5)	I (1–6)	I (1–6)
Sphagnum palustre		I (1–4)	I (2–7)	I (1–7)
Anemone nemorosa		I (2)	I (3–7)	I (2–7)
Epilobium obscurum		I (1)	I (3)	I (1–3)
Equisetum fluviatile		I (1–2)	I (2)	I (1–2)
Glyceria fluitans		I (2–4)	I (3)	I (2–4)
Ranunculus flammula		I (1–4)	I (3)	I (1–4)
Conocephalum conicum		I (1–2)	I (3)	I (1–3)
Sphagnum recurvum		I (1–3)	I (3–4)	I (1–4)
Myosotis secunda		I (1–2)	I (3)	I (1–3)
Pellia endiviifolia		I (1–4)	I (1)	I (1–4)
Sphagnum squarrosum		I (2–5)	I (3)	I (2–5)
Number of samples	23	39	40	102
Number of species/sample	26 (7–53)	32 (19–46)	31 (9–53)	30 (7–53)
Tree height (m)	13 (10–20)	12 (7–27)	14 (6–30)	13 (6–30)
Tree cover (%)	77 (60–100)	70 (10–100)	71 (20–100)	72 (10–100)
Shrub height (m)	4 (2–5)	4 (2–7)	4 (1–7)	4 (1–7)
Shrub cover (%)	13 (0–55)	32 (1–90)	42 (5–95)	32 (0–95)
Herb height (cm)	57 (30–120)	48 (15–120)	42 (10–150)	48 (10–150)
Herb cover (%)	95 (80–100)	86 (40–100)	85 (15–100)	88 (15–100)
Ground height (mm)	7 (1–25)	26 (1–10)	27 (10–40)	22 (1–40)
Ground cover (%)	11 (0–20)	22 (3–100)	22 (2–85)	21 (0–100)
Altitude (m)	117 (60–300)	141 (2–340)	185 (8–366)	152 (2–366)
Slope (°)	5 (0–25)	10 (2–40)	16 (0–45)	11 (0–45)

a *Urtica dioica* sub-community

b *Carex remota-Cirsium palustre* sub-community

c *Deschampsia cespitosa* sub-community

7 *Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum* woodland (total)

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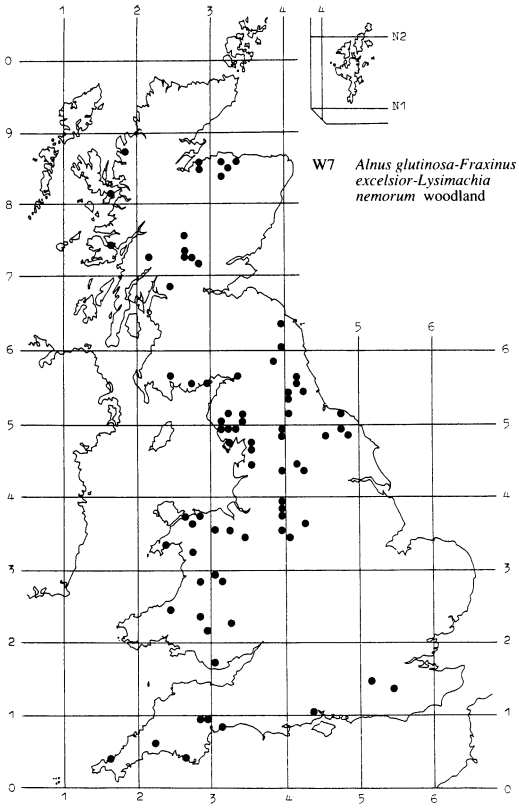

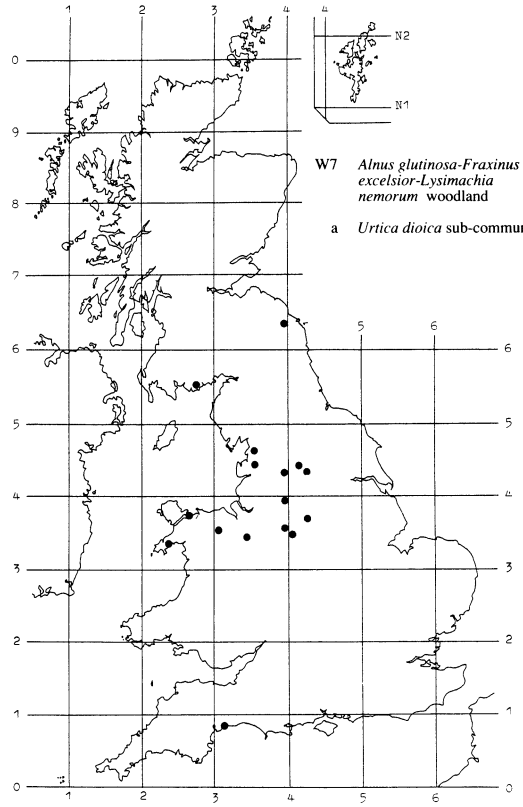

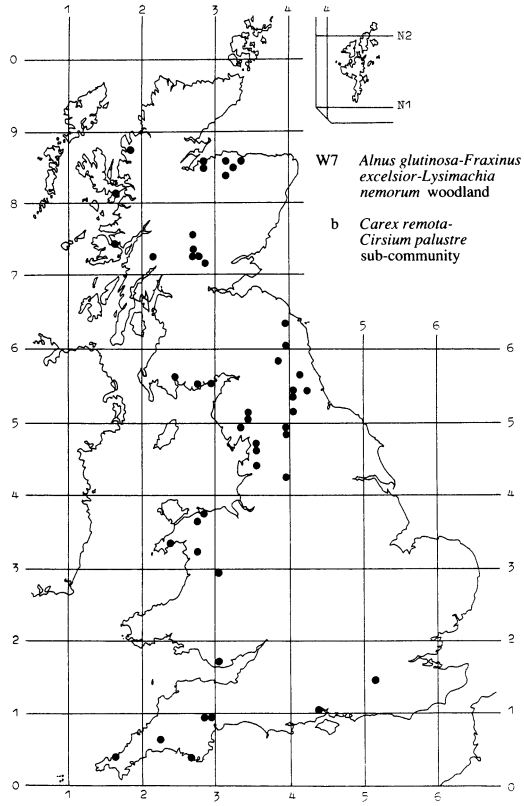

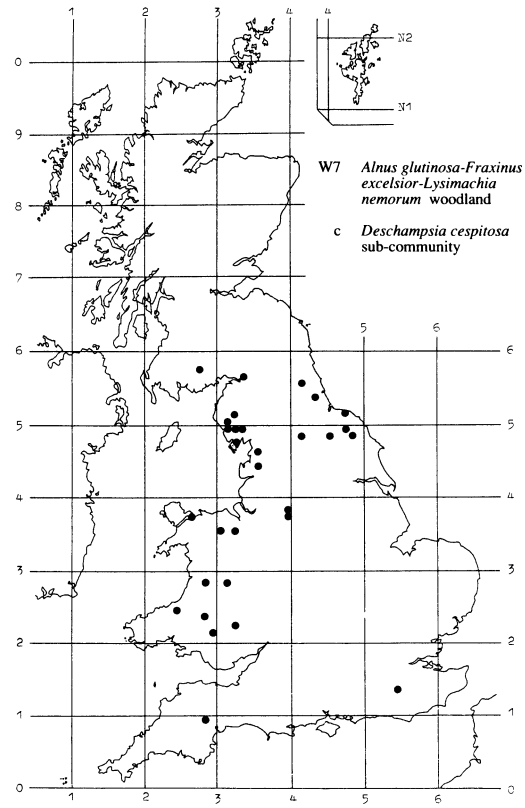

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