National Plant Monitoring Scheme

Online Training Materials 4: Introduction to Broadleaved Woodland

Plantlife | UK Centre for Ecology & Hydrology | Botanical Society of Britain & Ireland | JNCC | NIEA Northern Ireland Environment Agency www.daera-ni.gov.uk | An Agency within the Department of Agriculture, Environment and Rural Affairs www.daera-ni.gov.uk

National Plant Monitoring Scheme

An introduction to UK National Plant Monitoring Scheme broad habitat type

BROADLEAVED WOODLAND

Produced by Ben Averis for the NPMS in May 2020

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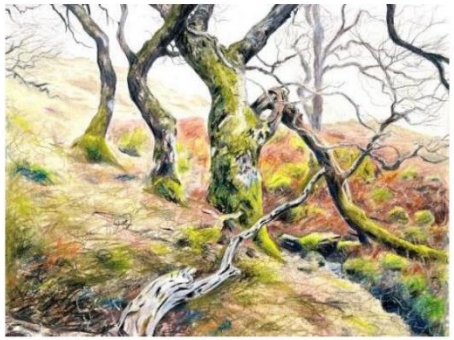
This broad habitat type consists of all deciduous woodland (including young plantations but excluding ornamental and commercial plantations), and hedgerows of native tree and shrub species. It is divided into three fine-scale habitat types:



DRY DECIDUOUS WOODLAND: on well-drained ground, with little or no wetland plant element and with a tree or shrub canopy that can be very varied but generally with no more than just a little of the alder and willow species characteristic of the wet woodland fine-scale type. Although yew is a conifer, yew woodland is included in this dry deciduous woodland category because its flora has more in common with that of certain types of broadleaved woodland than with that of native pine and juniper woodland.

WET WOODLAND: on wetter ground, with a wetland element in both the ground layer and the tree/shrub canopy; trees and shrubs commonly include some of alder, grey willow, eared willow and crack willow; there can also be other trees and shrubs that are equally common in dry and wet woodland (e.g. downy birch, ash, goat willow and bird cherry).

HEDGEROWS OF NATIVE SPECIES: a self-explanatory title, these hedgerows being made up of native species such as hawthorn, blackthorn, elder, gorse, broom, ash, oak, holly, hazel and, in southern Britain, other species such as field maple, dogwood and spindle.

DRY DECIDUOUS WOODLAND

Trees: very varied, including oak (pedunculate, sessile, or the hybrid between the two), downy birch, silver birch, ash, sycamore, Norway maple, beech, wych elm, rowan, holly, goat willow, wild cherry, common lime, aspen, white and grey poplars, yew, sweet chestnut and, in southern Britain, field maple, small-leaved and large-leaved limes, whitebeams, wild service-tree and hornbeam.

Shrubs: again, variable and including hazel, hawthorn, blackthorn, elder, bird cherry, guelder rose, and, in southern Britain, dogwood, spindle, wayfaring tree and Midland hawthorn.

Ground layer species: even more variable!

Within the dry deciduous woodland category the species composition varies mainly according to the acidity of the soils, so this section looks at floristic variation within each of three sub-categories: woodland on strongly acid soils; woodland on neutral to slightly acid soils; woodland on more calcareous or base-rich soils.

In dry deciduous woodland on acidic soils the main trees are birches and oaks (pedunculate or sessile, or hybrids), but there can also be others including rowan, holly and beech. Here are examples of birch woodland in acid upland situations: downy birch woodland in Wester Ross in February (L) and silver birch woodland in Speyside in July (R).

Here are examples of oak woodland on acid soils, in north Wales in February (L) and Argyll in May (R).

The main ground layer species in dry deciduous woodland on strongly acid soils are heather *Calluna vulgaris* and bilberry/blaeberry (blaeberry = Scottish name) *Vaccinium myrtillus* (these two dwarf shrub species being palatable and most abundant or luxuriant where grazing is lighter), wavy hair-grass *Deschampsia flexuosa* (dominant in many heavily grazed acidic woods), and mosses. Colourful herbs are not prominent but there can be a scatter of a few low-grown species such as tormentil *Potentilla erecta*, heath bedstraw *Galium saxatile* and wood sorrel *Oxalis acetosella*. Ferns such as bracken *Pteridium aquilinum* and lemon-scented fern *Oreopteris limbosperma* can be common.

Here is a dominance of heather and bilberry/blaeberry on the ground beneath a canopy of silver birch, in Speyside in July. The abundance and luxuriant growth of these dwarf shrubs shows that grazing is only light.

Having mentioned heather and bilberry, let's have a closer look at these and some similar ground flora species, as well as a grass that very commonly accompanies them (flowering periods given numerically, e.g. Fl 7-9 = July-September):

Heather *Calluna vulgaris.* Leaves tiny and not in whorls. Very small pale pink flowers. A bit more light-demanding than bilberry. Dominant in many heaths, but also very common in acid birch and oak woods. Palatable to large herbivores. Fl 7-9.

Bell heather *Erica cinerea.* Leaves in whorls of 3. Bright mid-pink-purple flowers. Less common than heather in woods. Mainly in heaths. The most light-demanding dwarf shrub on this page. Palatable to herbivores. Fl 7-9.

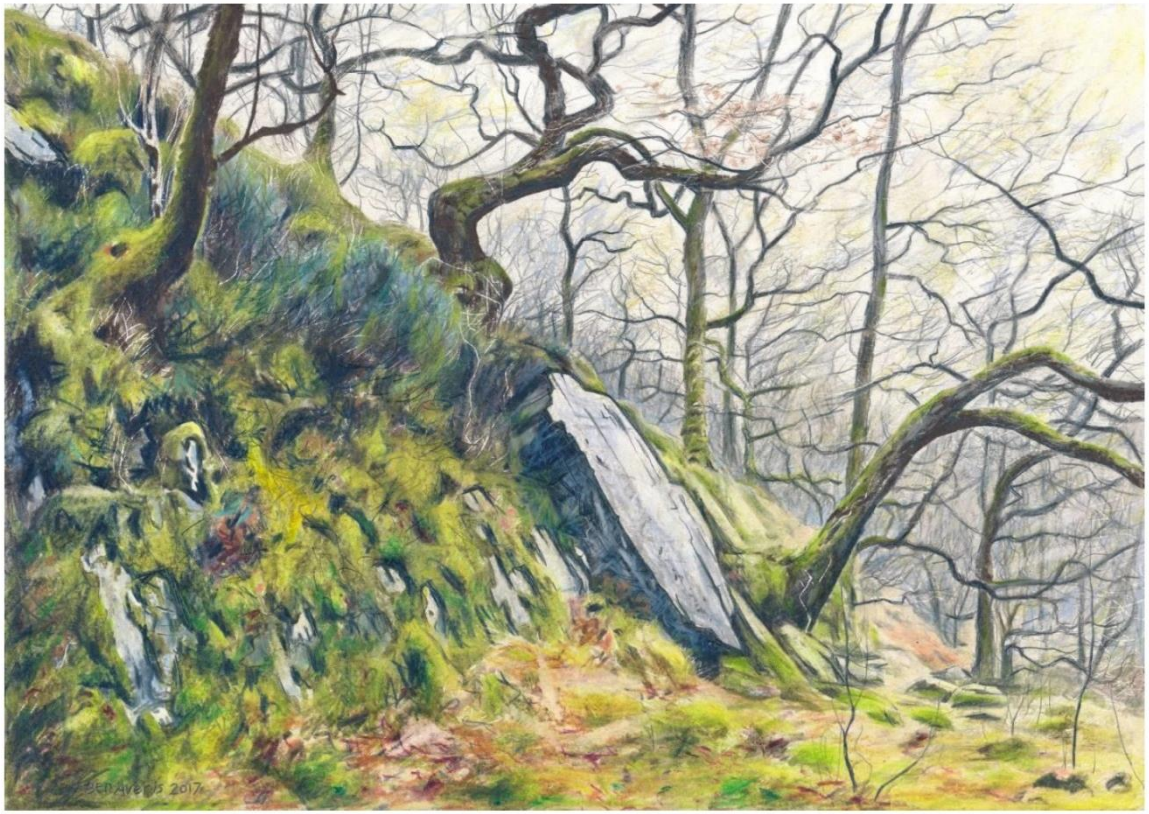
Bilberry (Scottish = blaeberry) *Vaccinium myrtillus.* Stems green and ridged. Leaves oval and pointed, with toothed edges. Shade-tolerant (but also common in heaths) and can be very plentiful in acid birch and oak woods. Palatable to large herbivores. Fl 4-6.

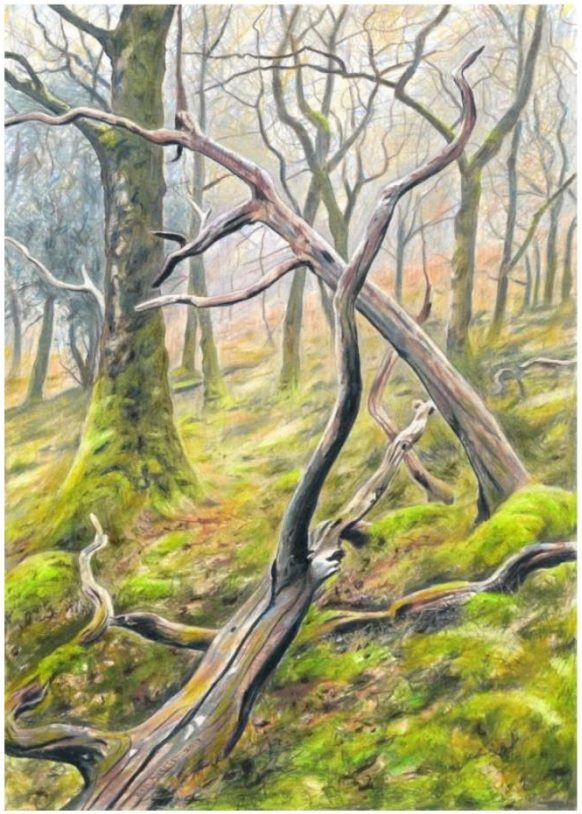
Cowberry *Vaccinium vitis-idaea.* Stems browner and not ridged. Leaves dark, evergreen, blunt and untoothed. Shade-tolerant, but scarcer than bilberry and heather in woods (woodland occurrences are in northern upland areas). Not very palatable. Fl 6-8.

Wavy hair-grass *Deschampsia flexuosa.* Open 'airy' flower head with very thin branches. Leaves thin and wiry. On acid soils in woods and in many open habitats. Not very palatable to herbivores. Fl 6-7.

Here, on acid soils in East Lothian, we see a dominance of wavy hair-grass *Deschampsia flexuosa* beneath oaks in more heavily grazed woodland. Dwarf shrubs are reduced, by grazing, to just a few very short and sparse sprigs of bilberry/blaeberry *Vaccinium myrtillus* (not visible in this photo).

In the most rainy parts of western Britain we can find very mossy native woodland that is actually a form of temperate rainforest, much of it on acid soils and with a canopy of mainly oak and birch along with other trees and shrubs such as rowan, holly and hazel. These two examples here are in acidic oak-dominated temperate rainforest in Morvern, in the west Highlands. On these acid soils there aren't many of the NPMS positive indicator species for dry deciduous woodland (though the holly in the picture on the right is one such species), but that doesn't mean the habitat is of low quality – it is naturally this way and the very rich moss, liverwort and lichen flora on rocks, trees, logs and the ground more than makes up for that.





Now, NPMS have asked me to scatter a few questions through my introductory material about habitats, so here are some:

Q1: How do you tell downy birch *Betula pubescens* and silver birch *B. pendula* apart?

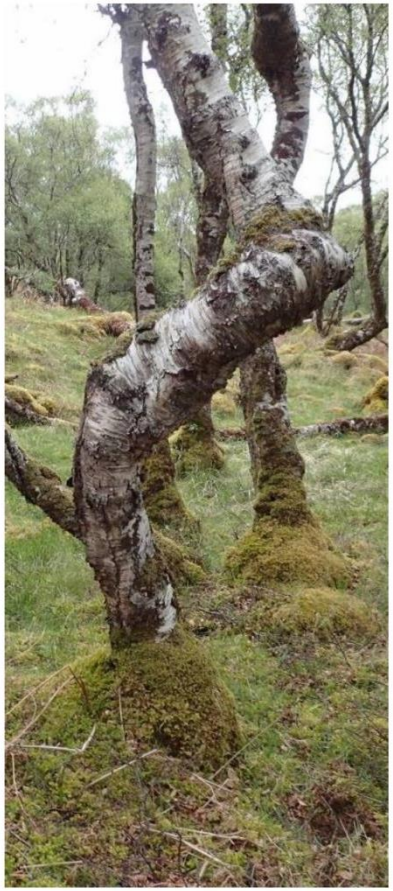
That might seem like an unfair question in that I haven't yet explained the difference between downy and silver birch, but maybe you know already? If not, that's OK – you will know very soon. On the next page, in fact.

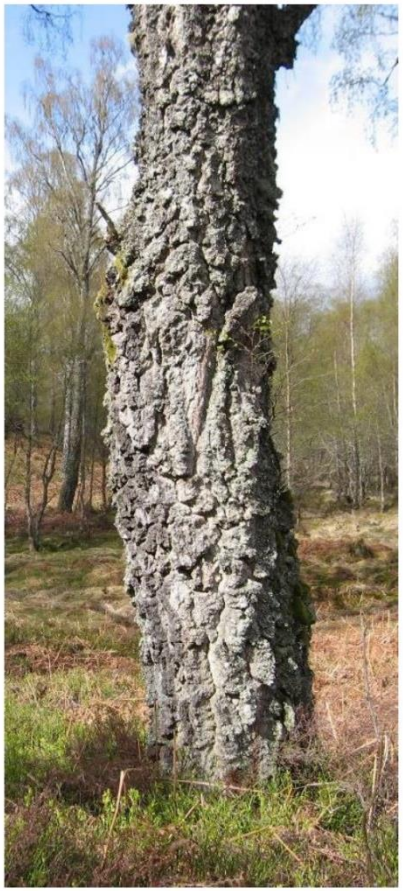
Q2: What species of grass is particularly common in woodland on strongly acid soils? Answer on page 13.

Q3: In a minimally grazed birchwood on a shady, north-facing slope in an upland area, what vascular plant species might you expect to be particularly abundant on the ground?

I had to say 'vascular plant species' there, in case you were thinking 'mosses', but although mosses (and liverworts and lichens) can indeed be very abundant in such woods they are outside the remit of NPMS. Answer on page 13.

Birches





Downy birch *Betula pubescens*

Oval to diamond-shaped leaves with singly-toothed edges. Overall shape more irregular than silver birch, and does not grow as tall. Lower trunk typically with an irregular mix of dark and pale or whitish, with horizontal patterning. Grows on dry to wet acid soils. Flowering = April-May.

Silver birch *Betula pendula*

Leaves more diamond-shaped with double teeth and more drawn-out pointed tips. Grows taller than downy birch, with gracefully hanging twigs. Old trees typically have grey, deeply fissured bark on the lower trunk. Mostly on dry acid soils. Flowering = April-May.

Oaks. Now that we've done birches, I suppose we'd better do oaks. Because (1) they are among the main trees in our broadleaved woods, and (2) well, you know, if I didn't 'do' them, people might say something because – have you noticed this? – some people seem to have a 'thing' about oaks, as though oaks are proved to be of higher status than, say, birches. Maybe it's got something to do with the rather irregular-looking wobbly edges to the leaves, combined with the name 'oak' being like 'old' in beginning with 'o' and having three letters! How? Well, lots of people like old things and irregular-looking things. Old + irregularly shaped = even better! Some old half-tumbled-down castle type of thing? They love it! A modern tower block, functional, and sculptural in its clean and simple straight-edged form and sense of scale? "No – not nice!" Anyway, oaks…

Sessile oak *Quercus petraea* has a leaf stalk about 1 cm long, a leaf base tapering gradually into that stalk and unstalked acorns. **Pedunculate oak *Q. robur*** has a leaf stalk less than 1 cm long, a leaf base ending 'abruptly' in two small lobes, and stalked acorns. Flowering = April-May. Hybrids between the two (e.g. leaf stalk about 1 cm long and with noticeable lobes at the leaf base) are really common. So – that's oaks done! Next? More trees? Tower blocks? OK – tree + tower block!

Old pedunculate oaks in East Lothian

Sessile oak leaf

Pedunculate oak leaf

Paisley, Renfrewshire

Answers to Q2-3 (from page 10): **A2:** wavy hair-grass *Deschampsia flexuosa*. **A3:** bilberry *Vaccinium myrtillus* especially likely. Heather *Calluna vulgaris* also very possible, and cowberry *V. vitis-idaea* if in the north. Wavy hair-grass likely to be present but as grazing is minimal this grass is likely to be just thinly scattered among dominant dwarf shrubs.

Next – here are three small herbs of dry deciduous woodland on soils ranging from strongly acid (as described above) to more mildly acidic (as described below on pages 14-26). 'Fl' followed by numbers = flowering months.

Wood sorrel *Oxalis acetosella*

Smaller white flowers with 5 petals (looking big here just because of scale of photo). Clover-like leaves with three leaflets. Fl 4-5.

Tormentil *Potentilla erecta*

Flowers with 4 yellow petals. Leaves with 3 leaflets + 2 leaflet-like stipules at the point where the leaf leaves the stem. Fl 5-9.

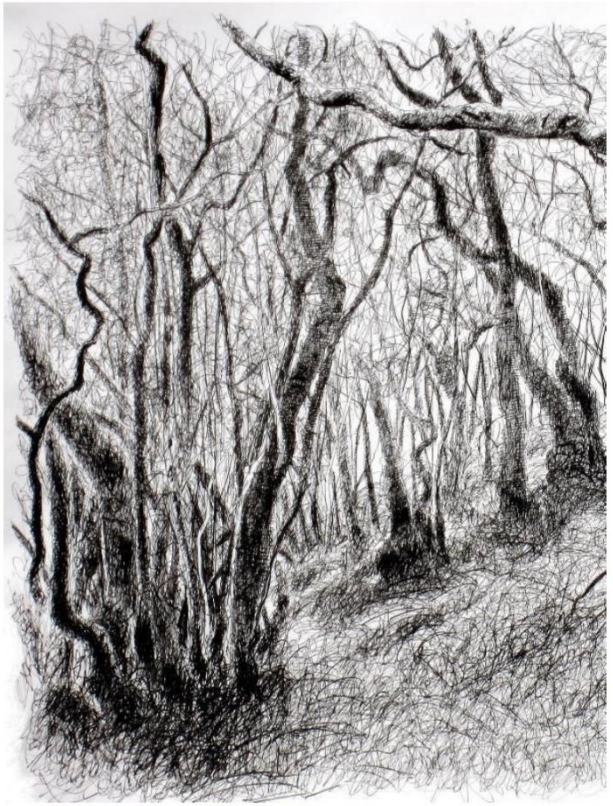
Heath bedstraw *Galium saxatile*

Small leaves in whorls of 4 to 8. Tiny hairs along leaf edge point outwards and forwards. No hairs on stems. Fl 6-8.

On soils that are mildly acidic to neutral there can be varied mixtures of trees and shrubs including oaks (sessile and pedunculate, or hybrids between the two), birches (downy and silver), ash, sycamore, Norway maple, beech, rowan, goat willow, wild and bird cherries, limes, aspen, white and grey poplars, sweet chestnut, hornbeam, hazel, hawthorn, blackthorn and elder. Here are some examples, starting with some oak woodland, with other trees and shrubs including hawthorn and holly, in Gloucestershire in April.

Beech can grow well and be dominant in the canopy in woodland on a wide range of soils. Here it is on what appear to be neutral to slightly acid soils (as judged by the ground flora beneath) at the upper edge of a mixed broadleaf wood in Lanarkshire (left) and on a hill slope in the west Highlands (right). In both places the beech is non-native, as in all but the southernmost parts of Britain, but it thrives well on a wide range of soils in all parts of the country. Its dense foliage casts a lot of shade which limits the extent and richness of the ground flora beneath, and this, combined with the acidifying effect of its leaf litter, can make it difficult to judge the actual natural soil conditions.

In many places, especially in the west, there are woods with a canopy consisting mainly or entirely of hazel. The ground vegetation here generally indicates soil conditions varying from mildly acid to quite basic. These pictures are of hazel woodland on the island of Seil, Argyll, on soils that appear more or less neutral (as judged by the flora). Hazel is a NPMS positive indicator species for dry deciduous woodland. Uncoppiced hazel in the west can be an important host for epiphytic mosses, liverworts, lichens and fungi. The orange splodges in the view on the left are the rare fungus *Hypocreopsis rhododendri*; western hazel woodland appears to be the main habitat for this species.



On the left is aspen woodland in Stirlingshire in July, on soil that appears (from the ground flora) to be mildly acid, as is common in aspen stands (though aspens can grow on soils varying from more strongly acid to slightly basic). The close-up of a fallen leaf (in October), on the right, shows the unmistakeable round shape and long stalk. Aspen woodland is uncommon, and this tree species is an important host for insects, mosses, liverworts and lichens.

The ground vegetation in dry deciduous woodland on neutral to slightly acid soils has very varied mixtures of bracken, grasses such as creeping soft-grass *Holcus mollis*, Yorkshire fog *H. lanatus*, common bent *Agrostis capillaris* and sweet vernal-grass *Anthoxanthum odoratum*, herbs such as bluebell *Hyacinthoides non-scripta*, primrose *Primula vulgaris*, common dog-violet *Viola riviniana*, wood anemone *Anemone nemorosa*, greater stitchwort *Stellaria holostea*, wood sorrel, tormentil and heath bedstraw, and, where grazing is only light, taller growths of certain palatable species: bramble, raspberry, honeysuckle and buckler/male ferns (tall, tufted *Dryopteris* species).

Here are creeping soft-grass, wood anemone, greater stitchwort, common dog-violet, *Dryopteris* ferns and a little honeysuckle in oak woodland on what appears to be neutral to slightly acid soils in Perthshire, in May.

Here, in moderately grazed oak-sycamore woodland in East Lothian in spring, are extensive swards of creeping soft-grass *Holcus mollis* and abundant bracken *Pteridium aquilinum* – very common species in broadleaved woodland on neutral to slightly acid soils in Britain generally. Unlike tufted *Dryopteris* ferns, bracken is not palatable to herbivores.

Inset: a coloured pencil drawing I did some years ago, of this same view but with added bluebell carpets drawn in because, in a sorry state of dissatisfaction (well, we're all human), I thought it needed a bit more colour. I figured bluebell would do the job nicely, especially as this kind of woodland is one of its main types of habitat.

This is a real carpet of bluebells *Hyacinthoides non-scripta* in moderately grazed oak-birch-rowan-hazel woodland in Argyll in spring. Bluebell is common but we shouldn't take it for granted because (1) it has quite a western, oceanic distribution in Europe, with Britain and Ireland being particularly good for it, and (2) the genetic purity of many populations, especially in the lowlands, is threatened by garden-escaped Spanish bluebell *H. hispanica* and the vigorous hybrid *H. hispanica x non-scripta* which has leaves to 3.5 cm wide (instead of up to 1.5 cm), flowers sticking out in all directions (not 'nodding' to one side) with blue (not cream or white) anthers and wider, less upturned ends. Bluebells flower between April and June.

Bramble *Rubus fruticosus* and male fern *Dryopteris filix-mas*, both palatable to large herbivores, grow well in this hazel woodland in Argyll, indicating that grazing is only very light here.

Wood spurge *Euphorbia amygdaloides* (an NPMS indicator species) is quite common in many woods on neutral to slightly acid soils in southern Britain. Here it is with bracken and grasses in moderately grazed oak woodland in Gloucestershire, in April. Wood spurge flowers between March and May.

Here are two pages of closer views of ground layer plants of dry deciduous woodland on neutral to slightly acid soils.

Wood sorrel, tormentil and heath bedstraw – already illustrated for acid woodland – also grow in some woods on neutral to slightly acid soils.

Primrose *Primula vulgaris* + common dog-violet *Viola riviniana* (a NPMS positive indicator species here). Primrose: Fl 12-5. Common dog-violet: Fl 4-6.

Germander speedwell *Veronica chamedrys*. Whitish hairs in 2 lines down stem; stem leaves hardly stalked. Wood speedwell differs in stalked leaves + hairs spread out all around stem. Fl 3-7.

Greater stitchwort *Stellaria holostea*. Square-sectioned stems. Narrow, slightly greyish-green leaves in opposite pairs. Flowers with 5 deeply notched petals. Fl 4-6.

The second of two pages of typical ground layer plants of dry deciduous woodland on neutral to slightly acid soils.

Wood anemone *Anemone nemorosa*. Leaves deeply divided in star-like pattern. Rather large white 6-petalled flowers. Fl 3-5.

Bugle *Ajuga reptans*. Creeping shoots with stalked, oval, obscurely-toothed leaves. Upright spikes of blue flowers. Fl 5-7.

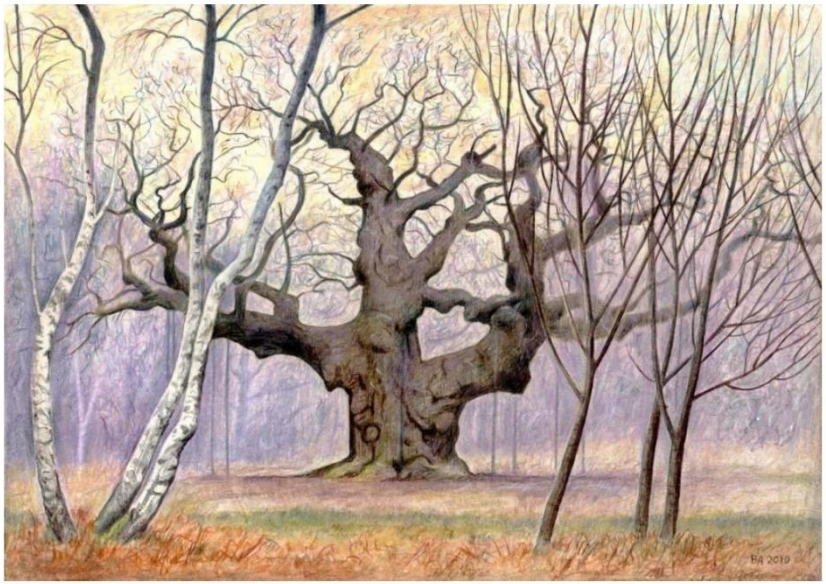
Greater woodrush *Luzula sylvatica*. Tufts of broad, bright green leaves can coalesce into extensive swards. Palatable to sheep, deer, etc. Fl 5-6.

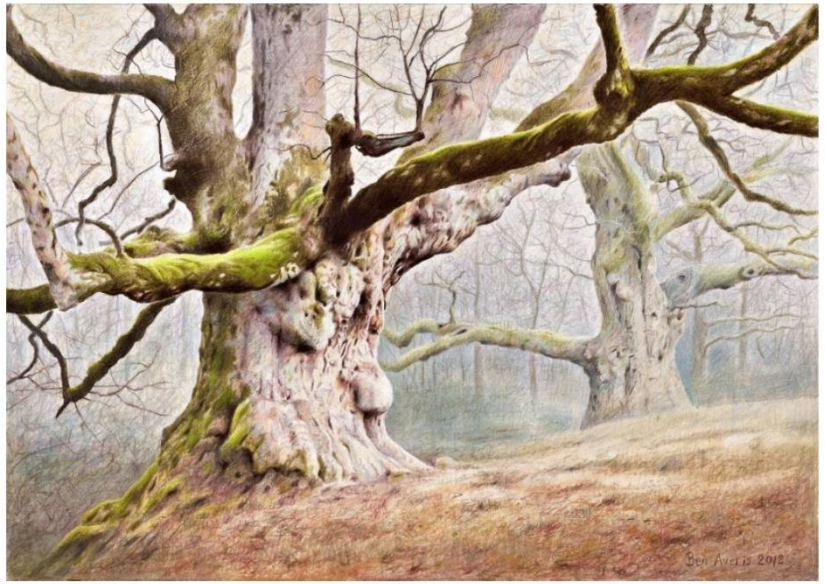
Some questions about dry deciduous woodland on neutral to mildly acid soils (answers on next page)

Q4: Is this plant (photo at right): **(a)** bugle, **(b)** self-heal or **(c)** early purple orchid?

Q5: How can you tell our native bluebell from the Spanish / hybrid bluebell?

Q6: What will go in the remaining space on this page?
Oh, that's a question for me! OK, I'll put something here…





Two scenes in woodland on neutral to mildly acid soils. One in Perthshire. One Nottinghamshire. Which is which?

Answers to Q4-6:

A4: **(b) Self-heal.** Flower spike shorter and more purple than in bugle; early purple orchid has longer and relatively narrower leaves that are not in opposite pairs up the stems.

A5: **Native bluebell:** leaves up to 1.5 cm wide; flowers in 'nodding' spike, mainly sticking out on one side of the stem; flowers quite tubular and not widening very obviously until the very end, which is distinctly upturned; anthers cream or white.

Hybrid/Spanish bluebell: leaves up to 3.5 cm wide; flowers sticking out in all directions around the stem; flowers more gradually widening out toward a wider and less upturned end; anthers blue.

A6: **Left picture:** Nottinghamshire. The big tree is 'The Major Oak' in Sherwood Forest.

Right picture: Perthshire. The Birnam sycamore (L) and Birnam oak (R). Massive trees by the River Tay.

Next – moving on to look at **dry deciduous woodland on more calcareous or base-rich soils…**

In dry deciduous woodland on more calcareous or base-rich soils, the trees and shrubs can be more noticeably different from those on neutral to acid soils. Ash, wych elm, field maple, bird cherry, yew, whitebeams, dogwood, spindle and wayfaring tree are commonest here and can be accompanied by others such as hazel, sycamore, rowan, beech, hawthorn, blackthorn and elder. Here is an example of ash-hazel woodland in Lochaber in the west Highlands, in June, with dog's mercury and wild garlic beneath.

This is hazel-dominated woodland on limestone in Argyll, in August

In the ground vegetation of these dry deciduous woods on calcareous/base-rich soils, herbs are typically abundant and include dog's mercury *Mercurialis perennis*, wood avens *Geum urbanum*, red campion *Silene dioica*, herb Robert *Geranium robertianum*, wild garlic *Allium ursinum*, hedge woundwort *Stachys sylvatica*, sanicle *Sanicula europaea*, woodruff *Galium odoratum*, wood speedwell *Veronica montana* and, in the south, early dog-violet *Viola reichenbachiana,* which looks like common dog-violet but has a dark (not pale) 'spur' sticking up behind the flower. Grasses tend to be scattered tufts rather than the extensive swards seen on neutral to acid soils; typical species are wood false-brome *Brachypodium sylvaticum*, hairy brome *Bromopsis ramosa* and wood melick *Melica uniflora*. Ferns include hart's-tongue *Phyllitis scolopendrium* and shield-ferns *Polystichum aculeatum* and *P. setiferum*.

Here is dog's mercury *Mercurialis perennis* (an NPMS positive indicator species) in ash-elm woodland in the Scottish Borders in June.

Three pages of plants of dry deciduous woodland on soils that are at least moderately calcareous or base-rich.

All four on this page are NPMS positive indicator species for dry deciduous woodland.

Woodruff *Galium odoratum*
Whorls of 6-9 bright green leaves. Fl 5-6.

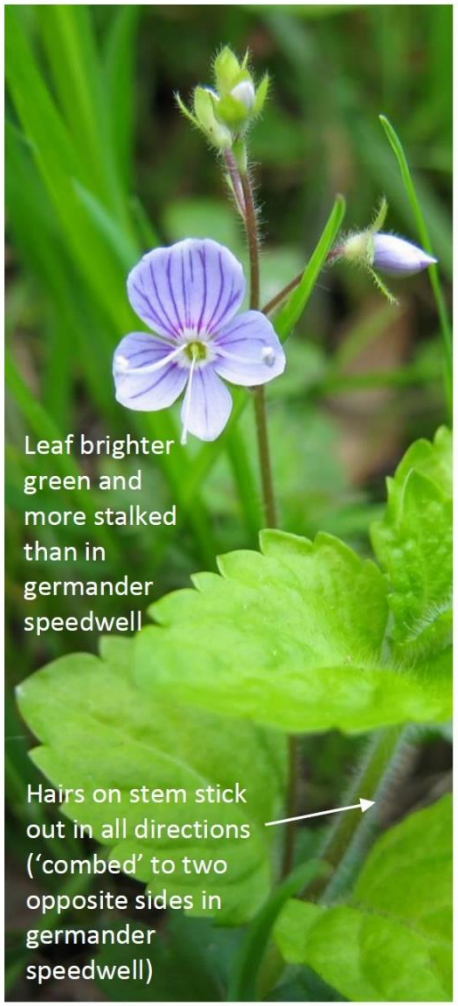
Sanicle *Sanicula europaea*
Leaves like buttercup or *Geranium* but hairless. Fl 5-9.

Wood avens *Geum urbanum*
Lower leaves with small leaflets to L + R of stalk + larger terminal leaflet.

Wild garlic *Allium ursinum*
Lush swards of large hairless oval leaves in spring; likes dampish soils.

Red campion *Silene dioica*
Hairy oval leaves in opposite pairs. NPMS positive indicator. Fl 5-6.

Wood sedge *Carex sylvatica*
Tuft-forming. Distinctive long, hanging female flower spikes NPMS positive indicator. Fl 7-9.



Wood speedwell *Veronica montana*
Similar to germander speedwell (see notes within photograph). NPMS positive indicator. Fl 4-7.

Herb Robert *Geranium robertianum*
Deeply divided, scented leaves. Fl 5-9.

Wood melick *Melica uniflora*

Wood false-brome *Brachypodium sylvaticum*

Both of these two grasses are NPMS positive indicator species.

Before we move on to wet woodland, here are some 'baddies' – the species listed by NPMS as negative indicators in dry deciduous woodland:

Stinging nettle *Urtica dioica* + Goosegrass *Galium aparine*

Stinging nettle's bad because it stings. Goosegrass is bad because it's pals with stinging nettle. Well – yes, but… The reason why they are on this negative list is that they increase in response to artificial nutrient enrichment (e.g. runoff from fields treated with agricultural fertilisers, or dung and urine from livestock) and can then outcompete other plants.

Ivy
Hedera helix

The problem here is that in some places – typically where artificially disturbed and then neglected – ivy can smother the ground and outcompete other plants and can also do the same on tree trunks, overshading some mosses, liverworts and lichens.

Snowberry
Symphoriocarpus albus

A rather nice-looking shrub, and apparently its angelic-looking pure white berries taste OK and contain toxins that won't be a problem unless you eat lots and lots – but it gets a bad press because it can spread quite rapidly and smother the native woodland ground vegetation.

Rhododendron
Rhododendron ponticum

I think this is the worst baddy. It spreads and spreads through woods, including special western temperate rainforest, overshading almost all the native plants beneath, and is hard to eradicate. Some people like it because of the colour of the pinky-purple flowers. Eh? Should we paint all our indoor walls bright red 'cos that's a nice happy bright colour?

WET WOODLAND

Tree and shrub species: these vary a bit less than in drier woodland and typically include wetland species such as alder, grey willow, eared willow and crack willow. There can also be other species that are equally common in dry and wet woodland: for example downy birch, goat willow and bird cherry. Much of our wet woodland has a rather shrubby canopy. Some wet woodland on nutrient-rich soils looks very different in having an even-aged stand of planted non-native poplars.

Ground layer species: again there is generally some kind of wetland element here – species such as meadowsweet, marsh bedstraw, marsh thistle, marsh marigold, marsh hawksbeard, water avens, bottle sedge, remote sedge, greater tussock-sedge, common reed, reed canary-grass, purple moor-grass, yellow flag, opposite-leaved golden saxifrage.

The following pages show examples of different types of wet woodland and their characteristic species, beginning with some examples on wet, acidic, peaty soils…

Purple moor-grass *Molinia caerulea* and bog myrtle *Myrica gale* beneath downy birches on wet, acidic, peaty soils near Aberfoyle, in August.

Purple moor-grass *Molinia caerulea* and bog myrtle *Myrica gale* beneath alder on acidic, peaty soils near Loch Lomond, in April, showing the characteristic pale buff colour of the old *Molinia* leaves.

Soft rush *Juncus effusus* beneath grey willow on more or less neutral soils near Glasgow, in August.

The stems of willows in places like this can be home to interesting assemblages of mosses, liverworts and lichens.

Left: common reed *Phragmites australis* among grey willow by a loch near Aberfoyle, in August. Right: the unmistakable tussocks of greater tussock-sedge *Carex paniculata* growing among grey willow on very wet ground in Inverclyde in January. Soils in both places appear to be more or less neutral.

A varied mix of species including yellow flag *Iris pseudacorus*, marsh hawksbeard *Crepis paludosa*, marsh marigold *Caltha palustris,* soft rush *Juncus effusus* and rough meadow-grass *Poa trivialis* beneath alders on wet neutral soils in Perthshire in July.

A lush (not very grazed!) growth of species including soft rush *Juncus effusus,* marsh thistle *Cirsium palustre* and marsh hawksbeard *Crepis paludosa* beneath alders on wet neutral soils on a hill slope in Perthshire in August.

A dominant sward of tufted hair-grass *Deschampsia cespitosa* beaneath alders in Glen Coe in July.

Lush vegetation including stinging nettle *Urtica dioica* and butterbur *Petasites hybridus*, with alder, osier and grey and purple willows on silty soils (appearing naturally rich in nutrients) by a river in East Lothian in June.

A lush sward of stinging nettle *Urtica dioica* beneath planted balsam poplars on damp to wet soils that are evidently nutrient-rich, on a level valley floor in East Lothian in May.

Next – a few pages of closer views of some plants of wet woodland…

All four on this page are NPMS positive indicator species for wet woodland and are found mainly on wet, more or less neutral soils.

Marsh marigold
Caltha palustris

Large heart-shaped leaves with small teeth along their edges. Big buttercup-like flowers.

Marsh hawksbeard
Crepis paludosa

Oval leaves with large teeth, some of which point backwards.

Yellow pimpernel
Lysimachia nemorum

Low, creeping shoots with small oval leaves in opposite pairs. Yellow 5-petalled flowers on thin delicate stalks.

Marsh pennywort
Hydrocotyle vulgaris

Easily told by its unmistakeable round leaves with shallowly/bluntly toothed ('crenulated') edges.

Four more species of wet, more or less neutral soils. The first two are NPMS positive indicator species for wet woodland.

Purple loosestrife
Lythrum salicaria

Tall spikes of pink-purple flowers. Narrow oval leaves in opposite pairs.

Wood club-rush
Scirpus sylvaticus

A kind of sedge with long leaves and branched heads with many small brown, rush-like flowers.

Marsh bedstraw
Galium palustre

Leaves in whorls of 4-6. Stems and leaves rough-textured because of tiny outward-pointing hairs.

Meadowsweet
Filipendula ulmaria

Reddish stems. Creamy-coloured flowers. Leaves with pairs of toothed leaflets along reddish central leaf stalk.

... and another four, of which the first three favour neutral soils and the last prefers more acid soils.

Marsh thistle
Cirsium palustre

Differs from the very common creeping thistle in its purple tinge and dark spines on stems as well as leaves.

Water avens
Geum rivale

Lovely drooping dull pink flowers. Lower leaves each divided into a few pairs of toothed leaflets (end leaflet largest).

Yellow flag
Iris pseudacorus

Laterally-flattened tufts of tall leaves + unmistakeable big yellow flowers.

Purple moor-grass
Molinia caerulea

Forms big tussocks on damp to wet ground, especially where soils are acidic and peaty.

It's time again for 'Name and Shame'! Species listed by NPMS as **negative indicators in wet woodland**.

Stinging nettle *Urtica dioica* + Goosegrass *Galium aparine*

Just the same as these species are in dry deciduous woodland, they are classed as negative indicators because they can increase in response to unnaturally (and variably damaging) high levels of nutrients.

Himalayan balsam *Impatiens glandulifera*

Worthy of respect for growing so big and tall despite being just an annual, and with amazing pink flowers too – but, sorry to say, it takes over at the expense of other plants of damp (especially riverside) ground and is not easy to eradicate. Fl 7-10.

Western skunk cabbage *Lysichiton americanus*

Hey, check this out! Krayzee! What a happy looker! How could there ever be any kind of problem with this bright yellow number? Well, same story, folks: it spreads and outcompetes native plants. Oh – and they say it don't smell too good either. Fl 4.

Giant hogweed *Heracleum mantegazzianum*

Seriously big. Taller than a person. And bad news because touching it can cause nasty rashes and irritation to human skin. It invades many lowland riversides and other dampish places. Fl 6-7.

Some questions about wet woodland plants

Q7: Marsh marigold looks very distinctive when in flower, but when not flowering its heart-shaped hairless leaves – especially if they happen to be on the small side – could be confused with those of another woodland herb that is very common but hasn't yet featured among these pages. What would that be?

Q8: How can you tell marsh bedstraw from heath bedstraw?

Q9: Is the leaf in the photo to the right **(a)** common valerian, **(b)** marsh valerian, **(c)** water avens or **(d)** meadowsweet?

Q10: Of all the wet woodland scenes shown in the photos on pages 35-43, which two do you think would show the greatest difference between summer and winter in terms of the visible quantity of vascular plant growth in the ground vegetation?

The answers await you on the next page →

Answers to questions 7-10

A7: **Lesser celandine *Ficaria verna*.** A low-grown plant with leaf margins more or less untoothed (lots of bluntish teeth in marsh marigold) and very different flowers. It flowers in spring and grows mostly on fairly dry to damp, more or less neutral soils in woods, but can also be found in hedgerows and grassland. Here is a photo.

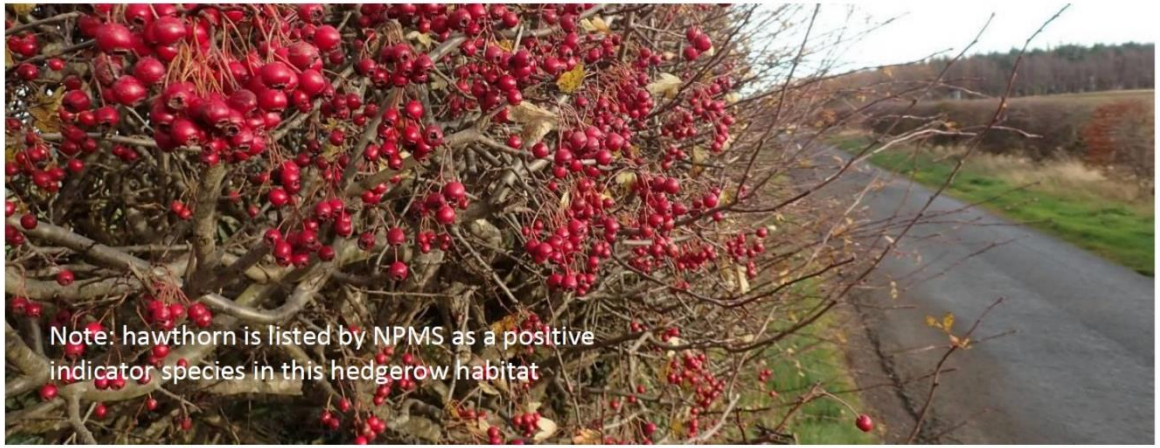
A8: Marsh bedstraw has **rougher stems and leaves** (because of their tiny outward-pointing slightly prickly hairs, in contrast to heath bedstraw's smooth stems and sparse forward-pointing hairs on its leaf margins), and **fewer leaves per whorl** (4-6 compared with heath bedstraw's 4-8). There is also fen bedstraw *Galium uliginosum*, which grows in similar places to marsh bedstraw (damp to wet and on more or less neutral soils), has even rougher-textured stems and leaves (with backward-pointing prickly hairs), and its leaves have sharply-pointed tips and are in whorls of 6-8.

A9: **(d) Meadowsweet**. Easy to tell by the red leaf stalk with leaflets along each side, interspersed with much smaller 'miniature leaflets'.

A10: **The last two.** They show woodland on very nutrient-rich soils that are favourable to plants (such as nettle, butterbur and comfreys) that grow big and lush in summer but die back down to almost nothing by winter, when there can be a lot of bare soil visible and the site can look like a very different place indeed. At the damper end of dry deciduous woodland, swards of wild garlic show a similarly big summer-winter difference. Woodland on very acid, nutrient-poor soil generally shows the least difference in ground vegetation appearance between summer and winter; this is because the vascular plants there are of a tougher, firmer texture and some of them, such as woody dwarf shrubs, do not die down in winter.

HEDGEROWS OF NATIVE SPECIES

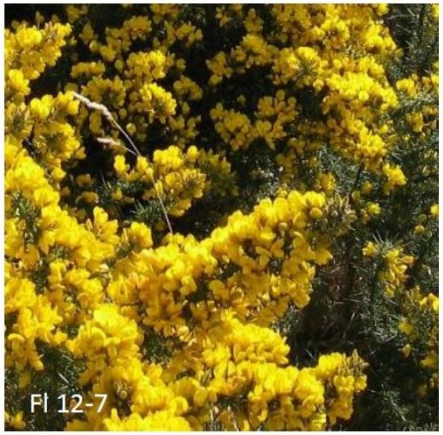
The commonest woody species here is generally hawthorn *Crataegus monogyna*, as seen here in East Lothian:



Also common are blackthorn *Prunus spinosa* (L and centre) and elder *Sambucus nigra* (R)

Hawthorn and blackthorn are listed as NPMS positive indicator species in this habitat.

Other woody species include gorse *Ulex europaeus* (L), broom *Cytisus scoparius* (middle; a NPMS positive indicator) and holly *Ilex aquifolium* (R).



The ground vegetation typically has affinities with grassland (especially tall neutral grassland with species such as false oat-grass *Arrhenatherum elatius*, cocksfoot *Dactylis glomerata* and white dead-nettle *Lamium album*) and/or woodland (with species such as red campion, greater stitchwort, dog's mercury and ferns (as in the left and middle photos below). This is an important habitat for woodland edge species such as garlic mustard *Alliaria petiolata* (photo at right below).

Hedgerows are a habitat for **climbers** such as honeysuckle *Lonicera periclymenum* (L), ivy *Hedera helix* (middle) and hedge bindweed *Calystegia sepium* (R). The first two of these are on the list of NPMS positive indicators in this habitat.

Talking of climbers, bramble *Rubus fruticosus* and roses *Rosa* species are common here too. Despite giving us such lovely edible fruits, bramble is listed as an NPMS negative indicator in hedgerows. What did it do wrong? Maybe it's because it can increase where there's less grazing? In 'undergrazed' grassland it can get going quite well and is understandably seen in negative terms, but in hedgerows maybe we should cut it some slack. Was it the prickles? Surley rose's prickles are worse! Bramble vs roses? Bramble for me! OK, others think differently. We can't all be the same. What a dull world that would be. So, to keep that dull world at bay, *someone's* got to be rosy about bramble.

In the south we find some distinctive climbing plants growing up through hedgerows. For example: hop *Humulus lupulus* and traveller's joy *Clematis vitalba* (both in left photo), white bryony *Bryonia dioica* (right photo) and black bryony *Tamus communis* (inset drawing of leaf). Traveller's joy and black bryony are listed as NPMS positive indicators in hedgerows.

Six of the 'best' – close views of six of the species listed as positive indicators in the NPMS hedgerow habitat:

Hart's-tongue *Phyllitis scolopendrium*

A fern of calcareous/base-rich soils.

Lords-and-ladies *Arum maculatum*

A herb of woods and hedgerows on neutral to basic soils; commonest in the southern half of Britain and in Ireland.

Enchanter's nightshade *Circaea lutetiana*

A mainly woodland species, preferring rather base-rich soils.

Foxglove *Digitalis purpurea*

Prefers acid soils, esp. where there has been ground disturbance.

Dogwood *Cornus sanguinea*

A shrub of woods and hedgerows on basic soils in the southern half of Britain.

Spindle *Euonymus europaeus*

Another shrub of woods and hedgerows on basic soils in the southern half of Britain; also widespread in Ireland.

Here are the familiar tall **umbellifers** that decorate so many of our hedgerows with their umbrella-like clusters of small whitish flowers and their finely-divided leaves, earning themselves the status of being included in the list of NPMS positive indicator species for the hedgerow habitat.

Rough chervil
Chaerophyllum temulum

Has purple-spotted stems and bluntish tips to the leaflets.

Hedge parsley
Torilis japonica

Stems not purple-spotted, and leaflets more pointed than in rough chervil. Whole leaf tapers to a long, narrow, pointed tip.

Hogweed
Heracleum sphondylium

Coarsely hairy. Thick stems and big leaves divided into fewer, larger leaflets/lobes than in the last two species.

☺ *So, this space here is for the fourth of that happy quartet of common hedgerow umbellifers: cow parsley – right?*

☹ **NO! COW PARSLEY CANNOT COME TO THE PARTY! COW PARSLEY HAS BEEN BANISHED TO THE BAD PAGE OF NPMS NEGATIVE INDICATORS!**

☹ *Why? What's it done? Why can't it be here as a positive indicator, or at least just an innocently 'neutral' characteristic companion and friend?*

😐 Well, apparently it's been seen showing increases in places with the kind of nutrient enrichment that helps things like nettles to grow more and outcompete smaller, less competitive plants. So: maybe guilty; or maybe 'guilty by association'.

A brief note about other NPMS indicator species in this hedgerow habitat

Having seen that bramble and cow parsley are listed as NPMS negative indicators for this hedgerow habitat, it is relevant to note the three remaining NPMS negative indicators here: these are goosegrass, nettle and Himalayan balsam, and all three were illustrated on the negative indicator page for wet woodland earlier in this document. Cow parsley is illustrated below. It is also worth noting that ivy is a positive indicator here in hedgerows but a negative one in dry deciduous woodland. Other species listed as NPMS positive indicators in hedgerows are wood avens, bluebell (both of which were illustrated earlier under dry deciduous woodland), burdock *Arctium minus/nemorosa*, ground ivy *Glechoma hederacea*, barren strawberry *Potentilla sterilis*, lesser stitchwort *Stellaria graminea* and golden rod *Solidago virgaurea*. These last five are illustrated below.

Cow parsley *Anthriscus sylvestris*. Umbellifer; rather like hedge parsley but taller; upper leaf surface hairless or with hairs sticking up (appressed in hedge p.).

Burdock *Arctium minus / nemorosa*. Large heart-shaped, thick-stalked leaves. Round purplish flower heads; fruits stick to clothing.

Ground ivy *Glechoma hederacea*. Roundish leaves in opposite pairs. Can carpet the ground. Purple-blue flowers.

Barren strawberry *Potentilla sterilis*. Leaves with 3 hairy leaflets (hairs on underside stick out; those of wild strawberry are appressed).

Lesser stitchwort *Stellaria graminea*. Narrow oval leaves in opposite pairs on square-sectioned stems. Flowers on very thin, wiry stalks.

Golden rod *Solidago virgaurea*. Oval leaves most numerous at plant base. Rather thick, stiff stem. Grows esp. in rocky places.