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Online Course Notes

Woodlands

Background

- Woodlands cover 13% of the UK (up from 5% 1921)
- 50% of this is coniferous
- 20% is ancient woodland (pre 1600)
- Woodland birds down by 27% since 1970
- 1 in 6 woodland plants are threatened with extinction
- Woodlands support 67% of the UK's butterfly species

Types of Woodland

- BROAD-LEAVED
 - Native
 - Plantation
- CONIFEROUS
 - Caledonian
 - Plantation
- PAWS (Plantation on Ancient Woodland Site)
- Mixed woodland

SOME TYPES OF BROAD-LEAVED WOOD

- Ancient Woodland
- Wet woodland
- Secondary Woodland
- Temperate rainforest
- Wood pasture

SPECIES

Ancient Woodland Indicators

Generally poor dispersers, their presence in significant numbers indicates ancient woodland status

The species vary across the country, so an AWIS in one county may not have the same status elsewhere



Woodland Indicators - Francis Rose list

Indicators of ancient woodland

Table 2 Ancient Woodland Vascular Plants in four regions of southern Britain. **SW** = south-west England (Cornwall, Devon, Somerset, Avon and Dorset); **S** = central-southern England (NCC 'South Region' - Hampshire, Wiltshire, Buckinghamshire, Berkshire and Oxfordshire); **SE** = south-east England (Kent, Surrey, Sussex, London and Hertfordshire); **EA** = East Anglia (Essex, Suffolk, Norfolk, Cambridgeshire).

Scientific name	Common name	SW	S	SE	EA
<i>Acer campestre</i> *	Field Maple	■	■	■	■
<i>Aconitum napellus</i>	Monk's-hood	■			
<i>Adoxa moschatellina</i>	Moschatel	■	■	■	■
<i>Allium ursinum</i>	Ramsons	■	■	■	■
<i>Anagallis minima</i>	Chaffweed	■		■	
<i>Anemone nemorosa</i>	Wood Anemone	■	■	■	■
<i>Aquilegia vulgaris</i> *	Columbine	■	■	■	
<i>Blechnum spicant</i>	Hard Fern	■	■	■	■
<i>Bromopsis ramosa</i>	Hairy-brome	■	■	■	■
<i>Calamagrostis canescens</i>	Purple Small-reed				■
<i>Calamagrostis epigejos</i>	Wood Small-reed	■	■	■	■
<i>Campanula latifolia</i>	Giant Bellflower	■			■
<i>Campanula trachelium</i>	Nettle-leaved Bellflower	■	■	■	■
<i>Cardamine amara</i>	Large Bitter-cress	■	■	■	■
<i>Carex lasiocarpa</i>	Smooth-stalked Sedge	■	■	■	■
<i>Carex pallescens</i>	Pale Sedge	■	■	■	■
<i>Carex pendula</i> *	Pendulous Sedge	■	■	■	■
<i>Carex remota</i>	Remote Sedge	■	■	■	■
<i>Carex strigosa</i>	Thin-spined Wood-sedge	■	■	■	■
<i>Carex sylvatica</i>	Wood-sedge	■	■	■	■
<i>Carpinus betulus</i> *	Hornbeam	■	■	■	■
<i>Cephalanthus longifolia</i>	Sword-leaved Helleborine	■	■		
<i>Ceratopogon clavilata</i>	Climbing Corydalis	■	■		■
<i>Chrysosplenium alternifolium</i>	Alternate-leaved Golden-saxifrage				■
<i>Chrysosplenium oppositifolium</i>	Opposite-leaved Golden-saxifrage	■	■	■	■
<i>Colchicum autumnale</i>	Meadow Saffron	■	■	■	■
<i>Conopodium majus</i>	Pignut	■	■	■	■
<i>Convallaria majalis</i> *	Lily-of-the-valley	■	■	■	■
<i>Crataegus laevigata</i>	Midland Hawthorn	■	■	■	■
<i>Daphne laureola</i> *	Spurge-laurel	■	■	■	■
<i>Dipsacus pilosus</i>	Small Teasel	■	■	■	■
<i>Dryopteris aemula</i>	Hag-scented Buckler-fern	■	■	■	■
<i>Dryopteris affinis</i>	Scaly Male-fern	■	■	■	■
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	■	■	■	■
<i>Elymus caninus</i>	Bearded Couch	■	■	■	■
<i>Epipactis helleborine</i>	Broad-leaved Helleborine	■	■	■	■
<i>Epipactis leptochila</i>	Narrow-lipped Helleborine	■	■		
<i>Epipactis purpurata</i>	Violet Helleborine	■	■	■	■
<i>Euasietum sylvaticum</i>	Wood Horsetail	■	■	■	■
<i>Eurymyia europaea</i>	Spindle	■	■	■	■
<i>Euphorbia amygdaloides</i>	Wood Spurge	■	■	■	■
<i>Festuca gigantea</i>	Giant Fescue	■	■	■	■
<i>Frangula alnus</i>	Alder Buckthorn	■	■	■	■
<i>Gagea lutea</i>	Yellow Star-of-Bethlehem	■			■
<i>Galium odoratum</i>	Sweet Woodruff	■	■	■	■
<i>Geum male</i>	Water Avens	■	■	■	■
<i>Gnaphalium sylvaticum</i>	Heath Cudweed	■			■
<i>Helleborus viridis</i> *	Green Hellebore	■	■	■	■
<i>Holcus mollis</i>	Creeping Soft-grass	■	■	■	■
<i>Hordelymus europaeus</i>	Wood Barley	■	■		
<i>Hyacinthoides non-scripta</i>	Bluebell	■	■	■	■
<i>Hymenophyllum tunbrigense</i>	Tunbridge filmy-fern	■	■		
<i>Hypericum androsaemum</i>	Tutsan	■	■	■	■
<i>Hypericum pulchrum</i>	Slender St John's-wort	■	■	■	■
<i>Ilex aquifolium</i>	Holly	■	■	■	■
<i>Iris foetidissima</i>	Stinking Iris	■	■	■	■
<i>Lamium galieifolium</i>	Yellow Archangel	■	■	■	■
<i>Lathraea squamaria</i>	Toothwort	■	■	■	■
<i>Lathyrus linifolius</i>	Bitter-vetch	■	■	■	■ (rare only)
<i>Lathyrus sylvestris</i>	Narrow-leaved Everlasting-pea	■	■	■	■
<i>Luzula forsteri</i>	Southern Wood-rush	■	■	■	■
<i>Luzula plosa</i>	Hairy Wood-rush	■	■	■	■
<i>Luzula sylvatica</i>	Great Wood-rush	■	■	■	■

Indicators of ancient woodland

<i>Lysimachia nemorum</i>	Yellow Pimpernel	■	■	■	■
<i>Meibomia trifida</i>	May Lily				■ (rare only)
<i>Malus sylvestris</i> *	Crab Apple	■	■	■	■
<i>Melampyrum cristatum</i>	Crested Cow-wheat				■
<i>Melampyrum pratense</i>	Common Cow-wheat	■	■	■	■
<i>Melica uniflora</i>	Wood Melick	■	■	■	■
<i>Melilotus alba</i>	Bastard Barn	■			■
<i>Milium effusum</i>	Wood Millet	■	■	■	■
<i>Molinia trimeria</i>	Three-winged Sandwort	■	■	■	■
<i>Myosotis sylvatica</i> *	Wood Forget-me-not	■	■	■	■
<i>Narcissus pseudonarcissus</i> *	Wild Daffodil	■	■	■	■
<i>Neotia nictitans</i>	Bird's-nest Orchid	■	■	■	■
<i>Ophrys insectifera</i>	Fly Orchid	■	■	■	■
<i>Orchis mascula</i>	Early Purple Orchid	■	■	■	■
<i>Orchis purpurea</i>	Lady Orchid	■	■	■	■
<i>Oreopteris limbosperma</i>	Lemon-scented Fern	■	■	■	■
<i>Oxalis acetosella</i>	Wood-sorrel	■	■	■	■
<i>Parnassia palustris</i>	Herb Paris	■	■	■	■
<i>Phegopteris connectilis</i>	Beech Fern	■	■	■	■
<i>Phyllitis scolopendrium</i> *	Hart's-tongue	■	■	■	■
<i>Pimpinella major</i>	Greater Burnet-saxifrage	■	■	■	■
<i>Polygonatum chloranthum</i>	Greater Butterfly-orchid	■	■	■	■
<i>Poa nemoralis</i>	Wood Meadow-grass	■	■	■	■
<i>Polygonatum multiflorum</i>	Solomon's-seal	■	■	■	■
<i>Polypodium vulgare (sensu lato)</i>	Polypody (all species)	■	■	■	■
<i>Polystichum aculeatum</i>	Hard Shield-fern	■	■	■	■
<i>Polystichum setiferum</i>	Soft Shield-fern	■	■	■	■
<i>Populus tremula</i>	Aspen	■	■	■	■
<i>Prunella spiralis</i>	Barren Strawberry	■	■	■	■
<i>Primula elatior</i>	Oxlip	■	■	■	■
<i>Primula vulgaris</i> *	Primrose	■	■	■	■
<i>Prunus avium</i>	Wild Cherry	■	■	■	■
<i>Prunus padus</i>	Bird Cherry	■	■	■	■
<i>Pulmonaria longifolia</i>	Narrow-leaved Lungwort	■	■		
<i>Pulmonaria officinalis</i>	Suffolk Lungwort				■ (rare only)
<i>Quercus petraea</i> *	Sessile Oak	■	■	■	■
<i>Radiola linoides</i>	Allseed	■	■	■	■
<i>Ranunculus acris</i>	Goldlocks Buttercup	■	■	■	■
<i>Ribes nigrum</i> *	Black Currant	■	■	■	■
<i>Ribes rubrum</i> *	Red Currant	■	■	■	■
<i>Rosa canina</i>	Field-rose	■	■	■	■
<i>Ruscus aculeatus</i>	Bulcher's Broom	■	■	■	■
<i>Sanicula europaea</i>	Sanicle	■	■	■	■
<i>Scirpus sylvaticus</i>	Wood Club-rush	■	■	■	■
<i>Scutellaria minor</i>	Lesser Skullcap	■	■	■	■
<i>Sedum telephium</i>	Orpine	■	■	■	■
<i>Serratula tinctoria</i>	Saw-wort	■	■	■	■
<i>Sibthorpia europaea</i>	Cornish Moneywort	■			■
<i>Solidago virgaurea</i>	Golden-rod	■	■	■	■
<i>Sorbus (microspecies)</i>	Whitebeam (microspecies)	■			■
<i>Sorbus aucuparia</i>	Rowan	■	■	■	■
<i>Sorbus torminalis</i>	Wild Service Tree	■	■	■	■
<i>Stachys officinalis</i>	Betony	■	■	■	■
<i>Stellaria neglecta</i>	Greater Chickweed	■	■	■	■
<i>Tamus communis</i>	Black Bryony	■	■	■	■
<i>Tilia cordata</i> *	Small-leaved Lime	■	■	■	■
<i>Ulmus glabra</i>	Wych Elm	■	■	■	■
<i>Vaccinium myrtillus</i>	Bilberry	■	■	■	■
<i>Veronica montana</i>	Wood Speedwell	■	■	■	■
<i>Viburnum lantana</i>	Wayfaring-tree	■	■	■	■
<i>Viburnum opulus</i> *	Gelder Rose	■	■	■	■
<i>Vicia sepium</i>	Bush Vetch	■	■	■	■
<i>Vicia sylvatica</i>	Wood Vetch	■	■	■	■
<i>Viola odorata</i>	Sweet Violet	■	■	■	■
<i>Viola palustris</i>	Mash Violet	■	■	■	■
<i>Viola reichenbachiana</i>	Early Dog-violet	■	■	■	■
<i>Waldenburgeria hederacea</i>	Ivy-leaved Bellflower	■	■	■	■

*Consider these species only if they occur well within the wood and do not appear to have been planted. † Found in only a small area at present but may have been overlooked.

Francis Rose (1999) Indicators of ancient woodland - the use of vascular plants in evaluating ancient woods for nature conservation. *British Wildlife*: 10 (4) 241 - 251. Available from NHBS, or short extract [here](#)

SURVEY

General principles

Carry out as much mapping as possible from aerial shots to work out extent, and composition of canopy

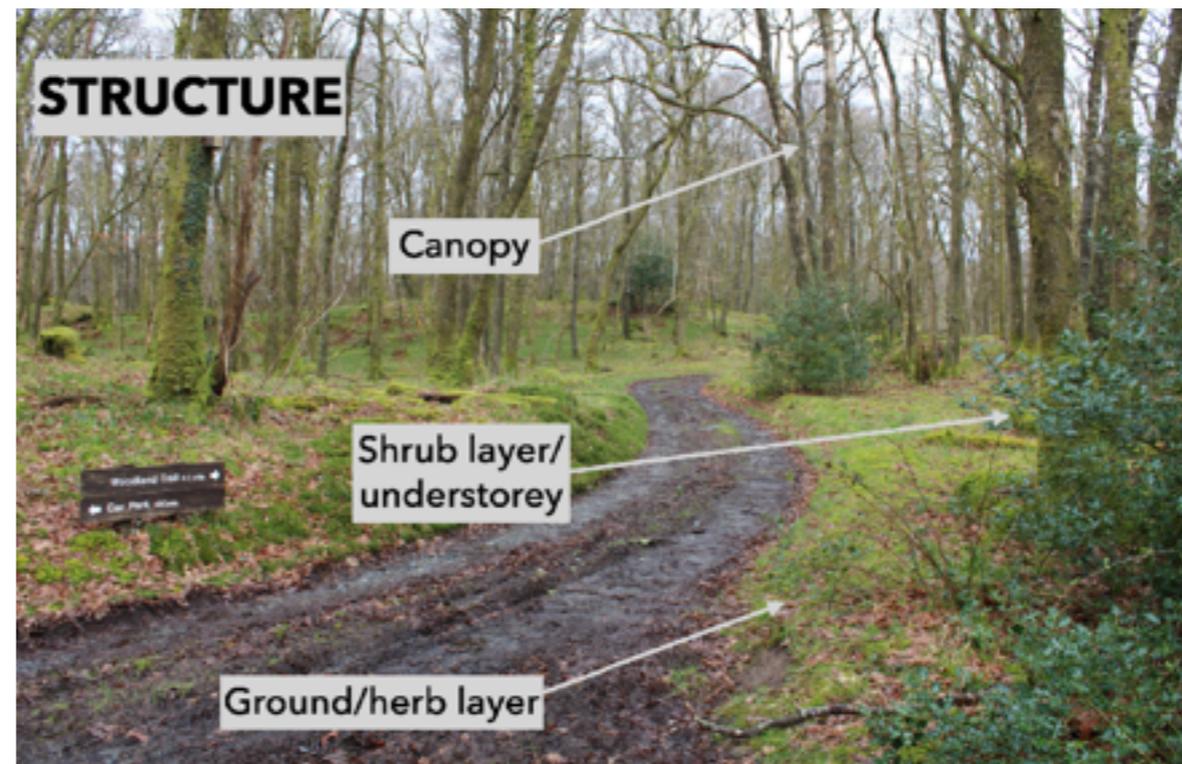
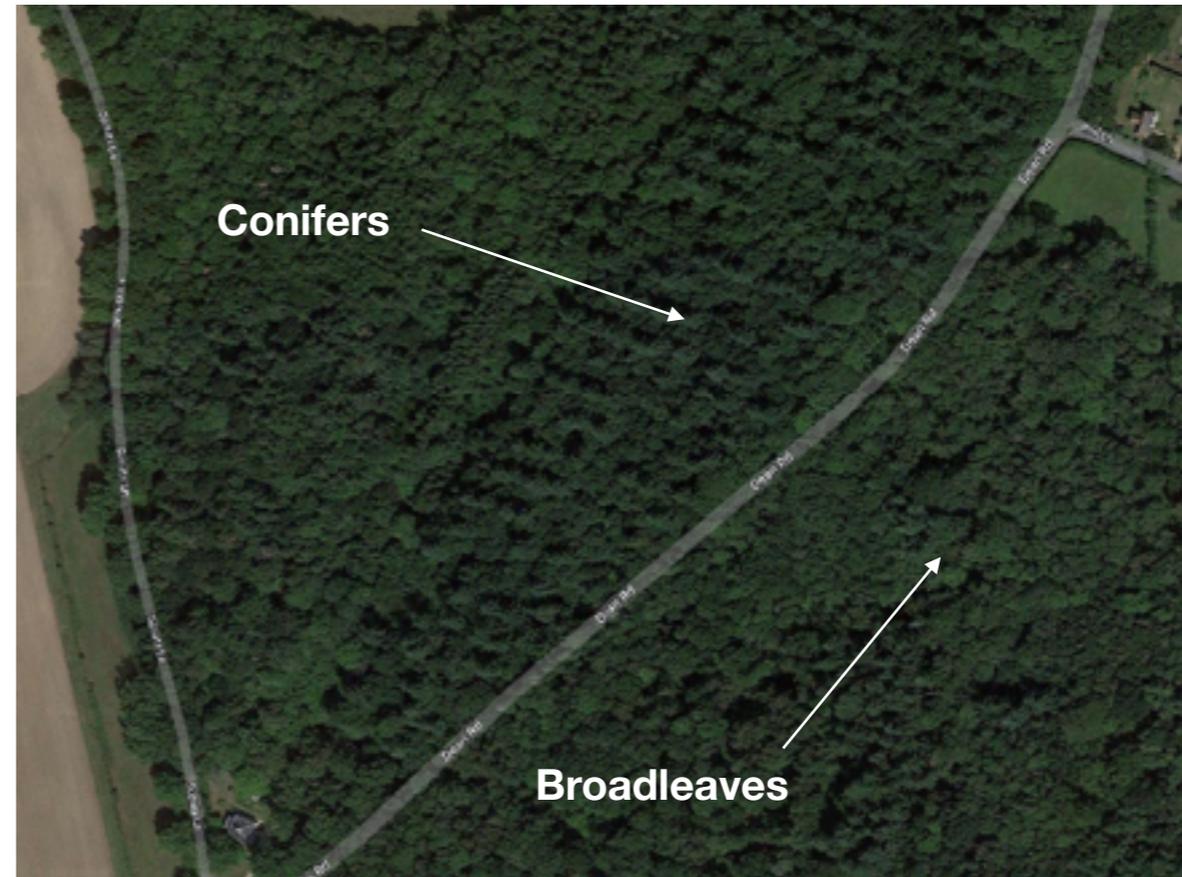
Use historical maps to ascertain age of woodland. Good resource [here](#).

Then 'ground-truth' this in the field

Record species in three layers (canopy/understorey/ground) using either percentage of DAFOR scales

- D Dominant
- A Abundant
- F Frequent
- O Occasional
- R Rare
- L Locally, indicating clumpy distribution

eg 'Bramble OLD' - Recorded occasionally but where found if formed extremely dense patches



SURVEY

Phase 1

Woodland defined as ‘vegetation dominated by trees more than 5m high when mature, forming a distinct, although sometimes open, canopy’

Categories

Broadleaved - less than 10% conifer

Coniferous - less than 10% broadleaved

Mixed - 10-90% of each

Distinction must be made between semi-natural and plantation. Most woods will fit into the semi-natural category, as this would include woodland with planted standards, mature coppice, under planted woods.

More info [here](#)

A Woodland and scrub		
1 Woodland		
1 Broad-leaved		
1 Semi-natural		Green
2 Plantation		Green
2 Coniferous		
1 Semi-natural		True Green
2 Plantation		True Green
3 Mixed		
1 Semi-natural		Green over true green
2 Plantation		Green over true green
2 Scrub		
1 Dense/continuous		Green
2 Scattered		Green
3 Parkland.scattered trees		
1 Broad-leaved		Green
2 Coniferous		True Green
3 Mixed		Green over true green
4 Recently-felled woodland		
1 Broad-leaved		Green
2 Coniferous		True Green
3 Mixed		Green over true green

SURVEY

UK Habitat Classification

Divides into a 4-level hierarchy with much greater range of categories

Use key to work out which type of woodland you have

The scale of the survey and therefore what your 'minimum mappable unit' is must be decided at the start of the survey, as this will dictate to what extent you record small stands of separate vegetation.

More info [here](#)

w1a5	Western acidic oak woodland (H91A0)
w1b5	Lime-maple woodlands of rocky slopes (H9180)
w1b6	Other upland mixed ashwoods
w1c5	Beech forests on acid soils (H9120)
w1c6	Beech forests on neutral to rich soils (H9130)
w1c7	Yew-dominated woodland (H91J0)
w1c8	Natural box scrub (H5110)
w1d5	Alder woodland on floodplains (H91E0)
w1d6	Bog woodland (H91D0)
w1f5	Dry oak-dominated woodland (H9190)
w1f6	Oak-hornbeam forests (H9160)
w1f7	Other Lowland mixed deciduous woodland
w1g6	Line of trees
w1g7	Other broadleaved woodland types
w1h5	Other woodland; mixed; mainly broadleaved
w1h6	Other woodland; mixed; mainly conifer
w2a5	Caledonian forest (H91C0)

w	Woodland and forest	w1	Broadleaved mixed and yew woodland	w1a	Upland oakwood
				w1b	Upland mixed ashwoods
				w1c	Lowland beech and yew woodland
				w1d	Wet woodland
				w1e	Upland birchwoods
		w1f	Lowland mixed deciduous woodland		
		w1g	Other woodland; broadleaved		
		w1h	Other woodland; mixed		
		w2	Coniferous woodland	w2a	Native pine woodlands
				w2b	Other Scot's Pine woodland
w2c	Other coniferous woodland				

SURVEY

National Vegetation Classification

Key to NVC is to map stands of homogenous vegetation, then take quadrats within each stand.

1. Work out where the stands of homogenous vegetation are.
2. Establish a canopy plot of 50x50m. (Plot can be different dimensions to fit vegetation).
3. Measure out a 10x10m square and record understory (scrub) species (diagonal 14.14m).
4. Measure out a 4x4m square and record all species.

If there is variation within the 50x50m plot then repeat the above for each stand

5. Combine all data and analyse

More info [here](#)

NVC Woodland Communities

- W1 Salix cinerea - Galium palustre woodland
- W2 Salix cinerea - Betula pubescens - Phragmites australis woodland
- W3 Salix pentandra - Carex rostrata woodland
- W4 Betula pubescens - Molinia caerulea woodland
- W5 Alnus glutinosa - Carex paniculata woodland
- W6 Alnus glutinosa - Urtica dioica woodland
- W7 Alnus glutinosa - Fraxinus excelsior - Lysimachia nemorum woodland
- W8 Fraxinus excelsior - Acer campestre - Mercurialis perennis woodland
- W9 Fraxinus excelsior - Sorbus aucuparia - Mercurialis perennis woodland
- W10 Quercus robur - Pteridium aquilinum - Rubus fruticosus woodland
- W11 Quercus petraea - Betula pubescens - Oxalis acetosella woodland
- W12 Fagus sylvatica - Mercurialis perennis woodland
- W13 Taxus baccata woodland
- W14 Fagus sylvatica - Rubus fruticosus woodland
- W15 Fagus sylvatica - Deschampsia flexuosa woodland
- W16 Quercus spp. - Betula spp. - Deschampsia flexuosa woodland
- W17 Quercus petraea - Betula pubescens - Dicranum majus woodland
- W18 Pinus sylvestris - Hylocomium splendens woodland
- W19 Juniperus communis ssp. communis - Oxalis acetosella woodland
- W20 Salix lapponum - Luzula sylvatica scrub
- W21 Crataegus monogyna - Hedera helix scrub
- W22 Prunus spinosa - Rubus fruticosus scrub
- W23 Ulex europaeus - Rubus fruticosus scrub
- W24 Rubus fruticosus - Holcus lanatus underscrub
- W25 Pteridium aquilinum - Rubus fruticosus underscrub

SPECIES ID NOTES - FORBS

<i>Ajuga reptans</i>	Bugle	Large dead kettle	Purplish bracts	Runners
<i>Anemone nemorosa</i>	Wood Anemone	Buttercup-like divided leaves, matt green	Hairless	6 sepals
<i>Conopodium majus</i>	Pignut	Small umbellifer	Very fine leaves	Edible tuber
<i>Euphorbia amygdaloides</i>	Wood Spurge	Strap-shaped leaves, on tufted stems	Overwintering leathery leaves	Exudes sap when cut
<i>Fragaria vesca</i>	Wild Strawberry	Leaves glossy pale green	Terminal leaflet longer than ones on each side	Sepals shorter than petals
<i>Galium odoratum</i>	Woodruff	Typical Bedstraw structure with whorls of leaves	Terminal clusters of white sweet-smelling flowers	
<i>Hyacinthoides non-scripta</i>	Bluebell	White stamens, unsubtly fragranced flowers	Flowers dangled to one side	Leaves not overly wide
<i>Lamiastrum galeobdolon</i>	Yellow Archangel	Dead nettle with large yellow flowers	Forms leafy horizontal runners	Leaves only variegated in non-native invasive ssp. <i>argentatum</i>
<i>Lonicera periclymenum</i>	Honeysuckle	Sweet smelling flowers forming red sticky berries	Older plants have woody stems with peeling bark	cf. Wood Spurge, which gives off latex when picked
<i>Mercurialis perennis</i>	Dog's Mercury	Lemon yellow when young through to deep green	Desperate male and female plans	
<i>Orchis mascula</i>	Early-purple Orchid	Flowers purple all over	Spots run up and down leaves	(cf Common Spotted - across)
<i>Oxalis acetosella</i>	Wood-sorrel	Clover-like edible leaves	White flowers with detailed purple venation	
<i>Potentilla sterilis</i>	Barren Strawberry	Leaves dullish blue	Terminal leaflet shorter than ones on each side	Sepals longer than petals
<i>Sanicula europaea</i>	Sanicle	Three-lobed leaves with very shiny underside	Flowers form pom-poms in loose umbels	
<i>Stellaria holostea</i>	Greater Stitchwort	Grass-like when vegetative	Petals joined up for the 'greater' part of them	cf Lesser Stitchwort petals, only joined at base
<i>Tamus communis</i>	Black Bryony	Very shiny bindweed-like leaves	Indistinct green flowers in spikelets from leaf axil	Dies away to just leave berries in winter
<i>Veronica chamaedrys</i>	Germander Speedwell	Large showy blue flowers	Stamens in pairs	Hairs in two opposite liens on sides of stem
<i>Veronica montana</i>	Wood Speedwell	Smaller pinky blue flowers	Stems hairy all over	
<i>Viola reichenbachiana</i>	Early Dog-violet	Purple spur at back of flower	(this may not always be reliable, in which case check stipules)	
<i>Viola riviniana</i>	Common Dog-violet	White spur at back of flower		

SPECIES ID NOTES - GRAMINOIDS

Grasses				
<i>Bromopsis ramosa</i>	Hairy-brome	Very tall with bristly hairy stems and leaves	Sometimes pointed auricles wrapped around stem	Dangly flower head with branches in pairs
<i>Holcus mollis</i>	Creeping soft-grass	Very soft but hairless leaves	Hairy nodes, hairless below	Soft white spike
<i>Melica uniflora</i>	Wood Melick	Leaves slightly hairy above, rough below	Leaf sheath prolonged into a bristle	Loose dangling purple-brown rice-like heads
<i>Milium effusum</i>	Wood Millet	Leaves arranged in loose tussocks	Sheaths are pale, ligules pointed	V. tall with panicles forming loose whorls
<i>Poa nemoralis</i>	Wood Meadow-grass	Very slender shiny leaves; tramlines	Leaves often sprawl over ground	Branched head, delicate, yet clumpy
<i>Schedonorus giganteus</i>	Giant Fescue	Wide waxy dark droopy leaves. Rough if rubbed down	Large clasping red/purple auricles; purple nodes	Large drooping panicle with small spikelets
Sedges				
<i>Carex pendula</i>	Pendulous Sedge	Large, dark green ridged leaves	Long pendulous fruits	Semi-invasive
<i>Carex remota</i>	Remote Sedge	Very fine droopy leaves	Fruits spread out	Lower bract longer than inflorescence
<i>Carex sylvatica</i>	Wood-sedge	Medium size, ridged leaves	Fruit erect and then dangling	Leaves W in cross section

SPECIES ID NOTES - FERNS & BRYOPHYTES

Ferns				
<i>Asplenium scolopendrium</i>	Hart's-tongue	Undivided fronds	Linear sori	
<i>Dryopteris dilatata</i>	Broad buckler-fern	3-pinnate	Dark groove along stem	Scales with central brown streak
<i>Dryopteris filix-mas</i>	Male-fern	Lobed pinnules	Scaly stem base	Robust
<i>Dryopteris affinis</i>	Scaly male-fern	Unlobed pinnules	Dark mark at base of pinnae	Long firm fronds
<i>Polystichum setiferum</i>	Soft shield fern	Loose fronds	Prominent thumb	Base of pinnule runs along stem
<i>Polystichum aculeatum</i>	Hard shield fern	Stiff fronds	Frond narrow at base	Base of pinnule points away from stem
Bryophytes				
<i>Atrichum undulatum</i>		Leaves undulate, slightly toothed. Often dark green	Forms loose mats	
<i>Frullania dilatata</i>		Dark brown/purple when wet forming dark circles	Overlapping inflated rounded leaves	Favours smooth-barked trees eg. Ash
<i>Metzgeria furcata</i>		Flat green patches on trees	Broad strap-shaped leaves splitting into Ys with thick visible mid-vein	
<i>Mnium hornum</i>		Forms compact mats	Sometimes with drooping capsules	Leaves translucent and toothed
<i>Plagiomnium undulatum</i>		Longish stems with long wavy leaves	Becoming branched when older	
<i>Polytrichum formosum</i>		Forms loose mats of dark green truly stems	Superficially resembling pine trees	Needle like leaves with ridges along backs
<i>Radula complanata</i>		Flat pale green patches	Very overlapping leaves	
<i>Thamnobryum alopecurum</i>		Forms loose cushions on forest floor	Individual plants tree-like have almost woody dark stem	

Purchase the Bryophytes Field
Guide [here](#) 😊

A photograph of a forest floor in spring. The ground is covered with a dense carpet of small purple bluebells. In the foreground, a large, moss-covered tree stump is prominent. The background shows a dense stand of tall, thin trees with fresh green leaves, suggesting a young forest or woodland. Sunlight filters through the canopy, creating dappled light on the ground.

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