

Dorset Biodiversity Appraisal Protocol Advice Note

Planting scheme recommendations

Introduction

This advice note was written with the East Dorset Environment Partnership and is intended primarily to assist ecological consultants and developers when submitting Biodiversity Plans (BPs) and Landscape & Ecological Management Plans (LEMPs) to DC NET for review under the Dorset Biodiversity Appraisal Protocol (DBAP) by describing how to maximise the biodiversity potential of good planting schemes designed to deliver multiple benefits and contribute to achieving biodiversity net gain. Making the most of existing habitats strengthened through strong eco-tones; sound planting composition; connectivity to ecological networks within and beyond site boundaries and appropriate on-going management are all fundamental elements of an outstanding planting scheme.

Submitted planting schemes for developments should seek to offer biodiversity benefit and comply with Dorset Council's Pollinators Action Plan and Green Infrastructure Strategies. Schemes should demonstrate how they will contribute to addressing the Climate & Ecological Emergency Strategy (Draft 2020). Currently, many schemes appear to be generic designs that do not take account of local conditions and are based on widely available and low-cost shrubs; many of which are invasive, potentially invasive or nuisance plants known as 'garden thugs'. This is of particular concern where new sites for development are on the rural fringe and pose a significant risk of spreading damaging alien plant species into the wider countryside and sensitive semi-natural habitats. Recent published work by the Royal Horticultural Society (RHS) and others has focussed on lists of plants that attract pollinators rather than broader biodiversity considerations.

Many schemes use fastigate cultivars of trees. Although this look acceptable on scheme drawings, compared with the more natural form of a tree, they provide reduced leaf area and less shading, cooling, carbon-fixing and reduction of air borne particles, fewer flowers and fewer fruits/seeds. Their contribution to biodiversity therefore fails to maximise the health and well-being of residents. Many such cultivars of native species are from more northerly latitudes and other countries/continents. Forest Research advises that the provenance of a tree should be the same latitude or 2-4 degrees south. Ecological good practice endorses the use native wildflower and grass seed of local provenance: equally, native trees should be of local provenance thereby ensuring that other associated species (mycorrhizae, invertebrates and epiphytes) are adapted to them.

With increased risk and severity of storm events, exposed sites may need to consider planting shelter belts to reduce the risk of windthrow.

The most comprehensive recent work on urban tree selection includes:

- Trees and Design Action Group (2018) Species Selection for Green Infrastructure v1.3 (<http://www.tdag.org.uk/species-selection-for-green-infrastructure.html>)
- Forest Research. The Urban Tree Manual (<https://www.forestresearch.gov.uk/tools-and-resources/urban-tree-manual/>) but the data need to be considered in relation to local conditions and requirements.

Landscaping and planting design of a development should reflect the natural landscape in form, species selection and seasonal changes in colour and should form part of the overall design criteria for a site. Within the site, areas should be identified that will provide nesting opportunities for bees including tussocky unmanaged grassland, areas where hollow stems can be left *in situ*, well drained bare soil and bee bricks. Areas for features such as log piles for invertebrates should be an integral part of scheme design along with naturalistic wildlife areas that link to ecological networks and corridors both within and beyond the site boundaries. This will facilitate the movement of wildlife and form a strong eco-tone linking to more formally planted areas and features such as Sustainable Drainage Systems (see DBAP Sustainable Drainage Systems Advice Note).

Plant lists

Table 1 below lists recommended plants that will be beneficial to pollinators and have not been identified as invasive/potentially invasive. Other species may be acceptable if they have biodiversity merit but those listed should predominate. To achieve the greatest benefit from any planting scheme, a Landscape & Ecological Management Plan (LEMP) should be compiled and fully implemented by appropriate management companies. LEMPs often form a condition of planning permission and will need to be submitted to the planning authority for approval and include the timing of the cutting of shrubs and herbaceous species.

Designing schemes for the long-term with climate change in mind will maximise the cost effectiveness and resilience of planting. The RHS warns that with climate change both fruiting and ornamental *Prunus* (Cherries) and *Malus* (Apples) are likely to be more susceptible to flowers being damaged by wind and to disease (<https://www.rhs.org.uk/science/gardening-in-a-changing-world/climate-change>).

The list does not include biennials (e.g. foxgloves, forget-me-not) or herbaceous species (e.g. penstemon) that need more care and attention but would be suitable in for example care home gardens and private gardens. Annuals have been omitted from the list though many will readily self-seed once established.

Amenity grassland seeding should include native species that thrive in short turf (historically referred to as 'weeds') e.g. white clover, and speedwells. Research at Reading University predicts that grass-free 'lawns' will predominate with climate change (<https://phys.org/news/2017-04-outlines-climate-affect-gardeners.html>) simultaneously increasing wildflower and insect species and reduced mowing.

Species suitable for green walls and roofs have not been considered. This is a specialist subject that also requires building design input. Although such features are recommended in green infrastructure strategies and more information is available in the DBAP Sustainable Drainage Systems Advice Note (2021).

This advice note will be expanded to include hedgerows in a future edition.

General guidelines for planting for developments:

- Retain and include existing natural and semi-natural habitats in planting scheme design. Ensure these habitats are also enhanced where necessary; are appropriately buffered from the development and suitably managed in the long-term. Use native species where possible; include future veteran trees in appropriate areas; keep ornamental planting to more formal areas.
- Identify semi-natural habitats and notable, scarce or rare plants in the area - within and beyond the site boundary - that could be at risk from inappropriate planting.
- Establish what soil conditions are present across the site (nature of soil, pH, drainage, aspect and shade) and select plants accordingly.
- With climate change, diversity is particularly important to reduce the risk of new pests and plant diseases.
- Any species that are known to be susceptible to disease (e.g. box, holly, alder) should be certified disease free.
- Select only species that have a simple flower structure so that pollinators have access to both pollen and nectar; avoid double flowers.
- Include a wide selection of species that flower at different times of year to ensure continuity of pollen and nectar sources for different types of pollinator and also different types of flower to suit different pollinators - bees of all sizes and tongue lengths, butterflies and moths, beetles, hoverflies and other flies.
- Plant in groups so that pollinators do not waste energy in searching for flowers of the same species.
- Avoid plants that sucker or spread rapidly – ‘ground cover’ plants are invasive.
- Climbers should not be used as ground cover. They can become invasive and dominate the planting scheme. They should be used only on vertical surfaces (wall, trellis, arch etc) and managed to control spread.
- Allow space between shrubs to allow for growth without removing next season’s flowers. Fill in gaps with herbaceous perennials which also add structural diversity.
- Prune/cut back shrubs and climbers at appropriate times of year – identify which species flower on new growth and which on previous season’s growth. Ensure management prescriptions in LEMPs provide sympathetic management of retained natural habitats e.g. countryside hedgerows.
- Dead-head herbaceous plants to encourage further flower production.
- Trees should be sufficiently mature to make meaningful contributions to landscape and ecosystem services generally.

Table 2 lists plants to be excluded from planting schedules. It includes terrestrial plants that have been identified as invasive, near invasive and problem plants. Aquatic species including those that are likely to be introduced when clearing out aquaria have been excluded from this list but there are many in both the Natural England listing (reference 2 below) and in Wildlife and Countryside Act 1981 (as amended). For recommendations on planting schemes associated with Sustainable Drainage Systems refer to the NET advice note (2021).

Table 1: Recommended planting

Trees

Specific name *=native	Common Name	Pollinator season				Notes
		Winter	Spring	Summer	Autumn	
<i>Acer campestre</i> *	Field maple		+			
<i>Acer platanoides</i>	Norway maple		+			
<i>Acer saccharum</i>	Sugar maple		+			
<i>Aesculus hippocastanum</i>	Horse chestnut		+			
<i>Aesculus indica</i>	Indian horse chestnut			+		
<i>Arbutus unedo</i>	Strawberry tree				+	
<i>Carpinus betulus</i> *	Hornbeam		+			
<i>Castanea sativa</i>	Sweet chestnut			+		
<i>Catalpa bignonioides</i>	Indian bean tree			+		
<i>Catalpa ovata</i>	Yellow catalpa			+		
<i>Cercis siliquastrum</i>	Judas tree		+			
<i>Cornus sanguina</i> *	Native dogwood		+			
<i>Crataegus monogyna</i> *	Hawthorn		+			
(not <i>C. laevigata</i>)	(Midland Hawthorn)					
<i>Eucryphia spp. and cvs.</i>	Leatherwood			+		
<i>Halesia carolina</i>	Snowdrop tree		+			
<i>Ilex aquifolium</i> *	Holly		+			Flowering period 2-3 weeks. Good sources of nectar. Ensure plants are certified free of <i>Phytophthora ilicis</i> https://www.rhs.org.uk/advice/profile?PID=175
<i>Koelreuteria paniculata</i>	Pride of India			+		
<i>Liriodendron tulipifera</i>	Tulip tree			+		
<i>Malus sylvestris</i> *	Wild crab		+			

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<i>Malus spp. & single flowered cvs.</i>	Apple		+			
<i>Prunus avium*</i> (not <i>Prunus padus</i>)	Wild cherry (Bird cherry)		+			
<i>Prunus domestica</i>	Plum		+			
<i>Prunus dulcis</i>	Almond		+			
<i>Prunus incisa</i>	Fuji cherry		+			
<i>Prunus insititia</i>	Damson		+			
<i>Prunus mume</i>	Japanese apricot		+			
<i>Prunus x yedoensis</i>	A flowering cherry		+			
<i>Pyrus communis</i>	Pear		+			
<i>Quercus petraea*</i>	Pedunculate oak		+			
<i>Quercus robur*</i>	Sessile oak		+			
<i>Salix caprea* Male form only</i>	Goat willow		+			
<i>Sorbus aria*</i>				+		
<i>Sorbus aucuparia*</i>				+		
<i>Styphnolobium japonicum syn.</i> <i>Sophora japonica</i>	Japanese pagoda tree				+	
<i>Styrax japonicus</i>	Japanese snowbell, Snowflake flower			+		
<i>Tilia cordata*</i>	Small-leaved lime					
<i>Tilia x europaea*</i>				+		
<i>Tilia henryana</i>					+	Autumn flowering: reduced risk of hybridising with native lime spp.
<i>Tilia platyphyllos*</i>	Broad-leaved lime			+		
<i>Ulmus spp</i>	Elm		+			Pollen source. Honeydew collected by pollinators later in year.

Climbers

Specific name *=native	Common Name	Pollinator season				Notes
		Winter	Spring	Summer	Autumn	
<i>Campsis radicans</i>	Trumpet honeysuckle			+		
<i>Clematis cirrhosa</i> & cvs.	Spanish traveller's joy	+				
<i>Clematis vitalba</i> *	Old man's beard, traveller's joy			+	+	
<i>Hedera helix</i> *	Ivy	+			+	
<i>Hydrangea anomala</i> ssp. <i>petiolaris</i>	Climbing hydrangea			+		
<i>Jasminum officinale</i>	Common jasmine			+		
<i>Lonicera periclymenum</i> *	Native honeysuckle			+		

Shrubs

Specific name *=native	Common Name	Pollinator season				Notes
		Winter	Spring	Summer	Autumn	
<i>Abelia x grandiflora</i> & cvs.	Glossy abelia			+	+	
<i>Aesculus parviflora</i>	Bottlebrush buckeye			+		
<i>Acer campestre</i> *	Field maple			+	+	
<i>Aralia elata</i>	Japanese angelica tree			+	+	
<i>Aralia spinosa</i>	Hercules club			+	+	
<i>Berberis</i> spp. (not <i>B. thunbergii</i>)	Barberry		+	+		
<i>Brachyglottis</i> 'Sunshine'	Brachyglottis			+		
<i>Brachyglottis monroi</i>	Monro's ragwort			+		
<i>Bupleurum fruticosum</i>	Shrubby hare's ear			+	+	

<i>Buxus sempervirens</i> *	Box		+			Susceptible to box blight. RHS advise plant sporadically not as single species hedge. New blight resistant strains being developed. <i>Ilex crenata</i> is an alternative.
<i>Callicarpa bodinieri</i> var <i>giraldii</i> 'Profusion'	Beautyberry			+		
<i>Calluna vulgaris</i> *	Heather			+		Avoid cultivars if site is near heathland
<i>Caryopteris x clandonensis</i> 'Heavenly blue'	Bluebeard			+		
<i>Ceanothus</i> spp.	Californian lilac		+			
<i>Chaenomeles</i> spp.	Japanese quince		+			
<i>Cistus</i> spp. and cvs.	Rock rose, Sun rose					Prefers alkaline soils
<i>Cornus sanguinea</i> *	Native dogwood		+			
<i>Cornus mas</i> 'Aurea', 'Golden Glory'	Cornelian cherry	+	+			
<i>Corylus avellana</i> *	Hazel		+			Pollen
<i>Crataegus monogyna</i> * (not <i>C. laevigata</i>)	Hawthorn (Midland hawthorn)		+			
<i>Cytisus x praecox</i> and cvs.	Broom		+			
<i>Eleagnus angustifolia</i>	Oleaster			+		
<i>Eleagnus x ebbingei</i>	Ebbinge's silverberry				+	
<i>Erica cinerea</i> *	Bell heather			+		Avoid cultivars if site is near heathland Winter flowering spp are currently acceptable but may not be with climate change extending flowering season on heathland.
<i>Erica tetralix</i>	Cross-leaved heath			+		Avoid cultivars if site is near heathland
<i>Erysimum</i> (perennial varieties eg 'Bowles Mauve', 'Apricot Delight', 'Walburton's Fragrant Sunshine')	Perennial wallflower			+	+	
<i>Escallonia</i> spp. and cvs.	Escallonia			+		
<i>Eucryphia glutinosa</i>	Eucryphia			+		Lime free soil
<i>Euonymus europaeus</i> *	Spindle		+			

<i>x Fatshedera lizei</i>	Tree Ivy				+	
<i>Fothergilla</i> spp.	Mountain witch alder			+		
<i>Frangula alnus</i> *	Alder buckthorn			+		For acid soil in native hedgerows
<i>Fuschia</i> spp. and cvs.	Hardy fuscias				+	
<i>Hebe</i> spp. and cvs.	Hebe			+	+	
<i>Hydrangea paniculata</i> (but only cultivars with many fertile flowers e.g. 'Kyushu', 'Big Ben', 'Floribunda', 'Brussels Lace')	Paniculate (conical flowerheads) hydrangea				+	
<i>Hyssopus officinalis</i>	Hyssop				+	
<i>Ilex crenata</i>	Japanese holly				+	An alternative to Box. Male and female flowers on different plants.
<i>Kalmia latifolia</i>	Mountain laurel				+	
<i>Lavandula angustifolia</i>	English lavender				+	
<i>Lavandula x intermedia</i>	Lavandin				+	
<i>Lavandula stoechas</i>	French lavender				+	
<i>Lavatera olbia</i> (formerly <i>Malva</i>)	Tree lavatera (formerly Tree mallow)				+	
<i>Ligustrum vulgare</i> * (not <i>L. ovalifolium</i>)	Wild privet				+	
Mahonia x media (not <i>M. aquifolium</i> hybrids & cvs)	Mahonia	+				
<i>Malus sylvestris</i>	Wild crab			+		
<i>Olearia</i> spp. and cvs.	Daisy bush				+	
<i>Perovskia atriplicifolia</i>	Russian sage				+	
<i>Pieris formosa</i>	Lily-of-the-valley bush			+		
<i>Pieris japonica</i>	Lily-of-the-valley bush			+		
<i>Potentilla fruticosa</i>	Shrubby cinquefoil				+	
<i>Prostanthera coneata</i>	Alpine mint bush				+	

<i>Prunus avium</i> * (not <i>Prunus padus</i>)	Wild cherry (Bird Cherry)		+			
<i>Prunus incisa</i> 'Kajo-no-mai'	Fuji cherry		+			
<i>Prunus spinosa</i> *	Blackthorn		+			
<i>Prunus tenella</i>	Dwarf flowering almond		+			
<i>Ptelea trifoliata</i>	Hop tree			+		
<i>Rhamnus cathartica</i> *	Buckthorn					For native hedgerows in alkaline soils
<i>Rosa</i> spp. (not <i>R.ferruginea</i> , <i>R. multiflora</i> (<i>'Hollandica'</i>), <i>R. rugosa</i>)	Rose			+	+	
<i>Rosmarinus officinalis</i>	Rosemary			+		
<i>Salvia officinalis</i>	Sage			+		
<i>Sambucus nigra</i> *	Elder		+			
<i>Sarcococca hookeriana</i>	Winter box	+				
<i>Stachyurus praecox</i>	Early stachyurus		+			
<i>Tamarix ramosissima</i>	Tamarisk			+		
<i>Thymus</i> spp.	Thyme			+		
<i>Vaccinium corymbosum</i>	Blueberry		+			
<i>Vaccinium myrtillus</i>	Bilberry		+	+		
<i>Viburnum lantana</i> *	Wayfaring tree			+		
<i>Viburnum opulus</i> *	Guelder rose			+		
<i>Viburnum tinus</i> cvs.	Laurustine	+			+	
<i>Weigela florida</i>	Weigela			+		

Herbaceous perennials and bulbs

Specific name *=native	Common Name	Pollinator season				Notes
		Winter	Spring	Summer	Autumn	
<i>Achillea</i> spp.	Yarrow			+		
<i>Ajuga reptans</i>	Bugle			+		
<i>Allium</i> spp. (not <i>A. paradoxum</i> , <i>A. roseum</i> , <i>A. schoenoprasum</i> , <i>A. sicutum</i> , <i>A. triquetrum</i>)	Onion/garlic spp. (not few-flowered garlic, rosy garlic, chives, sicilian honey garlic, three-cornered garlic)			+		
<i>Anchusa azurea</i>	Italian bugloss			+		
<i>Anthemis tinctoria</i>	Dyer's chamomile			+		
<i>Arabis allionii</i>	Siberian wallflower			+		
<i>Aubretia deltoidea</i>	Aubretia		+			
<i>Bergenia</i> spp.	Elephant's ear		+			
<i>Betonica officinalis</i>	Betony			+	+	
<i>Campanula</i> spp. (not <i>C. poscharskyana</i> , <i>C. rapunculoides</i>)	Bellflower (not trailing bellflower, creeping bellflower)			+	+	
<i>Centaurea</i> spp.	Knapweed, Cornflower,			+		
<i>Colchicum</i>	Autumn crocus				+	
<i>Crocus</i> spp.	Crocus		+			
<i>Cytisus</i> spp.	Broom					Care is required where heathland soils are a consideration.
<i>Eranthis hyemalis</i>	Winter aconite					
<i>Erigeron</i>	Fleabane			+	+	
<i>Eryngium</i> spp.	Sea holly			+		
<i>Erysimum</i> eg 'Bowles Mauve', 'Apricot Delight', 'Walburton's Fragrant Sunshine'	Perennial wallflower			+		
<i>Gaillardia</i> spp.	Gaillardia			+	+	
<i>Galanthus nivalis</i>	Snowdrop	+				

<i>Geum</i> spp.	Geum, Avens		+	+	+	
<i>Geranium</i> spp. (not <i>Geranium endressii</i> x <i>versicolor</i> (<i>G. x oxonianum</i>))	Cranesbill, hardy geranium (French cranesbill)		+	+		
<i>Helleborus</i> spp.	Hellebore	+	+			
<i>Heuchera</i>	Coral bells			+	+	
<i>Hylotelephium spectabile</i> cvs. (syn. <i>Sedum spectabile</i>)	Sedum			+	+	
<i>Leucojum aestivum</i>	Summer snowflake			+		
<i>Leucojum vernum</i>	Spring snowflake		+			
<i>Monarda didyma</i>	Scarlet bee balm			+	+	
<i>Monarda fistulosa</i>	Bee balm			+	+	
<i>Muscari</i>	Grape hyacinth		+			
<i>Narcissus</i>	Daffodils	+	+			Useful for early pollen (not nectar)
<i>Nepeta x faasennii</i>	Catmint			+	+	
<i>Nepeta racemosa</i>	Catmint			+	+	
<i>Primula veris</i> *	Cowslip		+			
<i>Primula vulgaris</i> *	Native primrose		+			Not cultivars. Native primrose is more resilient to extreme changes in soil moisture.
<i>Pulmonaria</i> spp.	Lungwort		+			
<i>Rudbeckia</i> spp.	Coneflower			+	+	
<i>Salvia</i> spp.	Salvia			+	+	Summer & autumn flowering spp
<i>Scabious</i> spp.	Scabious			+	+	
<i>Sedum spectabile</i> (see <i>Hylotelephium spectabile</i> above)	Sedum			+	+	
<i>Stachys byzantinus</i>	Lamb's ears			+		
<i>Symphothrichum</i> spp. and hybrids	Michaelmas daisy				+	
<i>Thymus</i> spp.	Thyme			+		
<i>Viola odorata</i>	Violet		+			

Flowering season data from: WDJ Kirk & Howes, FN (2012) *Plants for Bees* ISBN 978-0-86098

RHS Plants for Pollinators (Data on flowering and pollinator value) <https://www.rhs.org.uk/science/conservation-biodiversity/wildlife/plants-for-pollinators>

Table 2: Species to be excluded from planting schedules (invasive, near invasive & problem terrestrial plants) as at 10.01.21

Species	Common name	Reference	Notes
Trees, shrubs, woody perennials			
<i>Acacia saligna</i>	Golden wreath wattle	6	
<i>Acer pseudoplatanus</i>	Sycamore	4	
<i>Ailanthus altissima</i>	Tree of heaven	2c,4,5,6	
<i>Alnus cordata</i>	Italian alder	2u	
<i>Amelanchier</i> spp.	Juneberry	4,5	
<i>Baccharis halimifolia</i>	Groundsel bush, Eastern Baccharis	6	
<i>Berberis thunbergii</i>	Japanese/thunberg's barberry	2m	
<i>Buddleja davidii</i>	Butterfly bush	2c,4,5	
<i>Buddleja globosa</i>	Orange-ball tree	2u	
<i>Chamaecyparis lawsoniana</i>	Lawson's cypress	2c	
<i>Colutea arborescens</i>	Bladder senna	5	
<i>Cornus alba</i>	White dogwood	2u	
<i>Cornus sericea</i> syn <i>C. stolonifera</i> <i>C. sericea</i> var <i>flaviramea</i>	Red-osier dogwood Golden twig osier	4,5	
<i>Cotoneaster bullatus</i>	Hollyberry cotoneaster	2c, 3	
<i>Cotoneaster conspicuosus</i>	Tibetan cotoneaster	2u	
<i>Cotoneaster conspicuosus x dammeri (C.x suecicus)</i>	Tibetan cotoneaster	2c	
<i>Cotoneaster dammeri</i>	Bearberry cotoneaster	2c	
<i>Cotoneaster dielsianus</i>	Diel's cotoneaster	2c	
<i>Cotoneaster divaricatus</i>	Spreading cotoneaster	2u	
<i>Cotoneaster franchetii</i>	Franchet's cotoneaster	2u	
<i>Cotoneaster frigidus x salicifolius (C. x watereri)</i>	Tree cotoneaster	2c	
<i>Cotoneaster hjelmqvistii</i>	Helmqvist's cotoneaster	2c	
<i>Cotoneaster horizontalis</i>	Wall cotoneaster	2c, 3,4,5	
<i>Cotoneaster integrifolius</i>	Entire-leaved cotoneaster	3,5	
<i>Cotoneaster lacteus</i>	Late cotoneaster	2c	
<i>Cotoneaster microphyllus</i>	Small-leaved cotoneaster	2c, 3,4	

<i>Cotoneaster prostratus</i>	Procumbent cotoneaster	2c	
<i>Cotoneaster rehderi</i>	Bullate cotoneaster	2c	
<i>Cotoneaster salicifolius</i>	Willow-leaved cotoneaster	2c	
<i>Cotoneaster simonsii</i>	Himalayan cotoneaster	2c, 3,4,5	
<i>Cotoneaster sternianus</i>	Stern's cotoneaster	2c	
<i>x Cuprocypris leylandii</i>	Leyland cypress	1	
<i>Cytisus striatus</i>	Hairy-fruited broom	2m	
<i>Eucalyptus</i> (genus)	Gum tree	4	
<i>Gaultheria mucronata</i> syn. <i>Pernettya mucronata</i>	Prickly heath, Lily of the valley tree	2u, 3	Particularly invasive on heathland soils including conifer plantations in Dorset
<i>Gaultheria shallon</i>	Shallon	4,5	Particularly invasive on heathland soils including conifer plantations in Dorset.
<i>Kerria japonica</i>	Japanese rose, batchelor's buttons	1, 2m	
<i>Laurus nobilis</i>	Bay	2c	
<i>Lespedeza cuneata</i>	Sericea lespedeza	6	
<i>Ligustrum ovalifolium</i>	Garden privet	2c	
<i>Lonicera nitida</i>	Wilson's honeysuckle	2c	
<i>Lonicera pileata</i>	Box-leaved honeysuckle	2u	
<i>Lupinus arboreus</i>	Tree lupin	2u	
<i>Lupinus arboreus x polyphyllus (L. x regalis)</i>	Tree lupin	2u	
<i>Mahonia aquifolium</i> , hybrids & cvs.	Oregon grape	4,8	
<i>Pernettya mucronata</i> (see <i>Gaultheria mucronata</i> above)	Gautheria, prickly heath	2u	
<i>Picea sitchensis</i>	Sitka spruce	2c,4	
<i>Pinus contorta</i>	Lodgepole pine	2u,4	
<i>Pinus nigra</i>	Corsican/Austrian pine	2c,4,5	
<i>Pinus pinaster</i>	Atlantic Maritime pine	4,5	
<i>Populus</i> spp.	Poplars	1	
<i>Prosopis juliflora</i>	Mesquite	6	
<i>Prunus laurocerasus</i>	Cherry laurel	1,4,5	
<i>Prunus lusitanica</i>	Portugal laurel	2c,5	
<i>Prunus serotina</i>	Rum cherry	4,5,8	

<i>Pseudotsuga menziesii</i>	Douglas fir	4	
<i>Pyracantha coccinea</i>	Firethorn	2c	
<i>Pyracantha rogersiana</i>	Asian firethorn	2c	
<i>Quercus cerris</i>	Turkey oak	2c,4,5	
<i>Quercus ilex</i>	Holm oak, evergreen oak	2c,4,5	
<i>Quercus rubra</i>	Red oak	2c	
<i>Rhododendron luteum</i>	Yellow azalea	2m,3,4	
<i>Rhododendron ponticum</i>	Rhododendron	3,4,5	
<i>Rhododendron ponticum</i> x <i>R. maximum</i>	Rhododendron hybrid	2c	
<i>Ribes odoratum</i>	Buffalo currant, clove currant	2c	
<i>Ribes sanguineum</i>	Flowering currant	4	
<i>Robinia pseudoacacia</i>	False acacia	1,2c, 3,4,5	
<i>Rhus typhina</i>	Sumach	1, 2m	
<i>Rosa ferruginea</i>	Red-leaved rose	2u	
<i>Rosa</i> 'Hollandica', <i>Rosa multiflora</i>	Dutch rose, multi-flowered rose	1,2c,5	
<i>Rosa rugosa</i>	Japanese rose	2c, 3,4,5	
<i>Rubus biflorus</i>	Two flowered raspberry	1	
<i>Rubus cockburnianus</i>	White-stemmed bramble	2c	
<i>Rubus spectabilis</i>	Salmonberry	4	
<i>Rubus tricolor</i>	Chinese bramble, groundcover bramble/raspberry	2c	
<i>Sorbaria</i>	False spiraea	1, 2c	
<i>Spiraea</i>	Spiraea	5, 7	Many are thicket forming and produce suckers. Species listed below are particularly vigorous, rampant & suckering.
<i>Spiraea alba</i> x <i>douglasii</i> = <i>S. billardii</i>	Billard's bridewort	5	
<i>Spiraea latifolia</i>			
<i>Spiraea alba</i> x <i>salicifolia</i> (<i>S. x rosalba</i>)	Billard's bridewort	2m	
<i>Spiraea salicifolia</i> x <i>douglasii</i> (<i>S. x pseudosalicifolia</i>)	Lange's spiraea, Confused bridewort	2u,5	
<i>Spiraea salicifolia</i> agg.	Bridewort	4,5	
<i>Symphoricarpos albus</i>	Snowberry	1,4,5	
<i>Symphoricarpos</i> x <i>doorenbosii</i>		1	

<i>Symphoricarpus microphyllus x orbicularis (S.x chenaultii)</i>		2u	
<i>Syringa vulgaris</i>	Lilac	4	
<i>Tamarix gallica</i>	Tamarisk	4	
<i>Thuja plicata</i>	Western red cedar	2u	
<i>Triadica sebifera</i>	Chinese tallow	6	
<i>Viburnum rhytidophyllum</i>	Wrinkled viburnum	2u	
Climbers			
<i>Echinocystis lobata</i>	Wild cucumber	4	
<i>Fallopia baldschianica</i>	Russian vine, mile-a-minute	1, 2c,4,5	
<i>Fallopia convolvulus</i>	Black-bindweed	5	
<i>Hedera colchica</i>	Persian ivy	2c	
<i>Humulus scandens</i>	Japanese hop	6	
<i>Lonicera japonica</i>	Japanese honeysuckle		
<i>Muehlenbeckia complexa (M. axillaris)</i>	Wire plant, necklace vine, Australian Ivy	5	
<i>Parthenocissus inserta</i>	False Virginia creeper	3,4	
<i>Parthenocissus quinquefolia</i>	Virginia creeper	2u, 3,4,5	
<i>Passiflora caerulea</i>	Passion flower	1	
<i>Pueraria lobata</i>	Kudzu vine	6	
Herbaceous perennials including bulbs, grasses and bamboos			As with bamboos avoidance rhizomatous grasses is recommended
<i>Acaena novae-zelandiae</i>	Pirri-pirri bur	2c,5	
<i>Acanthus mollis</i>	Bear's breeches	1,5	
<i>Acorus calamus</i>	Sweet flag	2u	
<i>Aegopodium podagraria</i>	Ground elder	4	
<i>Alchemilla mollis</i>	Garden lady's-mantle	2u,5	
<i>Alocasia cucullata (syn. Arum cucullatum)</i> <i>Caladium cucullatum</i>	Chinese taro	2m	
<i>Allium schoenoprasum</i>	Chives	1	

<i>Allium paradoxum</i>	Few-flowered garlic	1,4,5	
<i>Allium roseum</i>	Rosy garlic	5	
<i>Allium siculum</i> syn. <i>Nectaroscordum siculum</i>	Sicilian honey garlic	1	
<i>Allium triquetrum</i>	Three-cornered garlic	1,2c,4	
<i>Astroemeria aurea</i>	Peruvian lily	2u	
<i>Alternanthera philoxeroides</i>	Alligator weed	6	Can thrive in both dry and aquatic environments
<i>Ambrosia artemisiifolia</i>	Ragweed	4	
<i>Ampelodesmos pliniana</i>	Mauritania grass, rope grass, dis grass	2u	
<i>Andropogon virginicum</i>	Broom sedge bluestem	6	
<i>Anemanthele lessoniana</i> (syn. <i>Oryzopsis lessonia</i> , <i>Stipa arundinacea</i>)	New Zealand wind grass	1	
<i>Anemone x hybrid cultivars</i>	Japanese anemone	1	
<i>Anisantha diandra</i> (syn <i>Bromus diandrus</i>)	Great brome	5	
<i>Arum italicum</i>		1	
<i>Arundo donax</i>	Giant reed	2u, 4	
<i>Arundinaria</i> spp.	A running bamboo	1	
<i>Asclepias syriaca</i>	Common milkweed	6	
<i>Aster laevis x novi-belgii</i> + <i>A.x versicolor</i>	Late Michaelmas-daisy	5	
<i>Aster lanceolatus</i>	Narrow-leaved Michaelmas-daisy	5	
<i>Bashania</i> spp.	A running bamboo	1	
<i>Camassia</i>	Camassia	1	
<i>Campanula poscharskyana</i>	Trailing bellflower	2m	
<i>Campanula rapunculoides</i>	Creeping bellflower	4	
<i>Cardamine corymbosa</i>	New Zealand bittercress	2u	
<i>Cardamine macrophylla</i>	Large-leaved cuckoo flower	2m	
<i>Cardamine raphanifolia</i>	Greater cuckoo-flower	2c	
<i>Cardiospermum grandiflorum</i>	Balloon vine	6	
<i>Carex muskingumensis</i>	Musk sedge	2m	
<i>Carex pendula</i>	Weeping sedge	1	
<i>Carprobrotus edulis</i>	Hottentot fig	3,5	
<i>Ceratochloa carinata</i>	Californian brome	2u	
<i>Chimonobambusa</i> spp	A running bamboo	1	

<i>Cicerbita macrophylla</i>	Blue sow-thistle	4	
<i>Clavinodum</i>	A running bamboo	1	
<i>Claytonia sibirica</i>	Pink purslane	4	
<i>Cortaderia jubata</i>	Purple pampas grass		
<i>Cortaderia richardii</i>	Early pampas grass	2c	
<i>Cortaderia selloana</i>	Pampas grass	2u, 4	
<i>Cotula coronopifolia</i>	Buttonweed	2u	
<i>Crassula helmsii</i>	Australian swap stonecrop/New Zealand Pigmy weed	3,4	
<i>Crocasmia aurea x potsii (C. x crocosmiflora)</i>	Montbretia	2c,3,4,5	
<i>Crocasmia paniculata</i>	Aunt Eliza	2c	
<i>Crocasmia potsii</i>	Pott's montbretia	2c	
<i>Cymbalaria pallida (syn. Antirrhinum pallidum, Linaria allida)</i>	Italian toadflax	2m	
<i>Cyperus albostriatus 'Variegatus'</i>		2u	
<i>Cyperus eragrostis</i>	Pale galingale	2c	
<i>Cyperus haspan</i>		2m	
<i>Cyperus rotundus</i>	Purple nut sedge	2u	
<i>Datura stramonium</i>	Thorn apple	5	
<i>Disphyma crassifolium</i>	Purple dewplant	4,5	
<i>Doronicum pardalianches</i>	Leopard's-bane	4	
<i>Dryopteris felix mas</i>	Male shield fern		Too vigorous for landscape planting
<i>Echium pininana</i>	Giant Viper's bugloss	2u	
<i>Ehrharta calycina</i>	Perennial veltgrass	6	
<i>Epilobium brunnescens</i>	Willowherb	4	
<i>Equisetum hyemale var affine</i>	Rough horsetail	2m	
<i>Equisetum japonicum</i>	Barred horsetail	2m	
<i>Equisetum ramossimum var japonicum</i>	Branched horsetail	2m	
<i>Erigeron karvinskianus</i>	Mexican fleabane	2u	
<i>Erigeron glaucus</i>	Seaside daisy	2m	
<i>Euphorbia amygdaloides ssp robbiae</i>	Wood spurge	2c	
<i>Euphorbia cyparissas</i>	Cypress spurge	1	

<i>Euphorbia griffithii</i> 'Fireglow', <i>E.charachias</i> ssp <i>wulfenii</i> , <i>E. x martini</i>	Spurge, Mediterranean spurge, Martin's spurge		Can be toxic to cats, dogs, people and horses. Toxic sap https://www.gardenersworld.com/plants/ . No wildlife value.
<i>Fallopia japonica</i>	Japanese knotweed	3,4,5	
<i>Fallopia sachalinensis</i>	Giant knotweed	3,5	
<i>Fallopia japonica</i> x <i>F.sachalinensis</i> = <i>F.x bohémica</i>	Hybrid knotweed	2c, 3,4,5	
<i>Ficaria verna</i> ssp. <i>verna</i> (& cultivars)	Lesser celandine	1	
<i>Foeniculum vulgare</i>	Fennel	1	
<i>Geranium endressii</i> x <i>versicolor</i> (<i>G. x oxonianum</i>)	French Crane's-bill	2u	
<i>Gunnera manicata</i>	Brazilian giant rhubarb	4,5	
<i>Gunnera tinctoria</i>	Giant rhubarb	1,3,4,5,6	
<i>Gymnocoronis spilanthoides</i>	Senegal tea plant	2m,6	Mostly aquatic but can grow in marshy ground
<i>Helianthus tuberosus</i>	Jerusalem artichoke	4	
<i>Heracleum mantegazzianum</i>	Giant hogweed	4,5,6	
<i>Heracleum persicum</i>	Persian hogweed	6	
<i>Heracleum sosnowskyi</i>	Sosnowsky's hogweed	6	
<i>Hibanabambusa</i> spp.	A running bamboo	1	
<i>Hyacinthoides hispanica</i>	Spanish bluebell	4	
<i>Hyacinthoides</i> <i>Hispanic</i> x <i>non-scripta</i> = <i>H</i> x <i>massartiana</i>		2c	
<i>Hypericum calycinum</i> , <i>H. patulum</i>	Rose of Sharron, creeping St John's wort	1	
<i>Impatiens glandulifera</i>	Himalayan balsam	3,4,5,6	
<i>Indocalamus</i> spp	A running bamboo	1	
<i>Iris orientalis</i>	Turkish iris	2u	
<i>Iris laevigata</i>	Japanese iris	2m	
<i>Juncus xiphiodes</i>	Iris-leaved rush	2u	
<i>Kniphophia</i> x <i>praecox</i>	Greater red-hot poker	2u	
<i>Kniphophia uvaria</i>	Torch lily, red hot poker	2u	
<i>Lamiastrum galeobdolon</i> ssp <i>argentatum</i>	Variegated yellow archangel	2c,3,4,5	
<i>Leptinella squalida</i>	Brass buttons	1	
<i>Lindernia grandiflora</i>	Blue moneywort	2m	

<i>Lygodium japonicum</i>	Vine-like fern	6	
<i>Lysichiton americanus</i>	American/yellow skunk cabbage	2m,4,5,6	
<i>Lysimachia nummularia</i>	Creeping Jenny	1	
<i>Lysimachia punctata</i>	Yellow loosestrife	1	
<i>Lythrum virgatum</i> 'Dropmore Purple'	Purple loosestrife 'Dropmore Purple'	2m	
<i>Macleaya</i> spp.	Plume poppy	1	
<i>Mentha</i> spp.	Mint	1	
<i>Microstegium vimineum</i>	Nepalese browntop, Japanese stilt grass	6	
<i>Mimulus guttatus</i>	Monkeyflower	4	
<i>Mimulus luteus</i>	Blotched monkeyflower	5	
<i>Nothoscordum</i> (see <i>Allium sicutum</i> above)		1	
<i>Nothoscordum barbonicum</i> (see <i>Allium sicutum</i> above)		1	
<i>Oxalis</i> cultivars		1	
<i>Oxalis pes-caprae</i>	Bermuda buttercup	4,5	
<i>Oxalis latifolia</i>	Garden pink sorrel	2u	
<i>Parthenium hysterophorus</i>	Whitetop weed	6	Annual.
<i>Pennisetum setaceum</i>	Crimson fountain grass	6	
<i>Pentaglottis sempervirens</i> (<i>Anchusa sempervirens</i>)	Green alkanet,	5	
<i>Persicaria campanulata</i>	Lesser knotweed	2c,4,5	
<i>Persicaria perfoliata</i>	Asiatic tearthumb	6	
<i>Persicaria wallichii</i>	Himalayan knotweed	2c,4,5	
<i>Petasites albus</i>	White butterbur	4,5	
<i>Petasites fragrans</i>	Winter heliotrope	4,5	
<i>Petasites japonicus</i>	Giant butterbur	2c,4	
<i>Phalaris arundinacea</i>	Reed canary grass	1	
<i>Phragmites australis</i>	Common reed	1	
<i>Phormium</i> spp.			Vigorous non-native. Unsuitable for rural fringe developments. No biodiversity benefit.
<i>Phyllostachys</i> spp.	A running bamboo	1	
<i>Physalis alkekengi</i>	Chinese lantern	1	

<i>Pleiblastis</i> spp.	A bamboo		May remain clump forming in poor dry soil but can become invasive in warm, moist or favourable conditions.
<i>Polygonum cuspidatum</i>	Japanese knotweed		
<i>Pratia pedunculata</i> syn. <i>Lobelia pedunculata</i>	Blue star creeper	1	
<i>Pseudosasa</i> spp.	A bamboo	1	May remain clump forming in poor dry soil but can become invasive in warm, moist or favourable conditions.
<i>Pseudosasa japonica</i>	Arrow bamboo	1, 2c	
<i>Sagittaria latifolia</i>	Duck potato, Broad-leaved arrowhead	4	
<i>Saracenia purpurea</i>	Purple pitcher plant	5	
<i>Saponaria officinalis</i>	Soapwort	1	
<i>Sasa</i> spp	A bamboo	1	May remain clump forming in poor dry soil but can become invasive in warm, moist or favourable conditions.
<i>Sasa palmata</i>	Broad-leaved bamboo	1,2c,5	
<i>Sasaella</i>	A bamboo	1	May remain clump forming in poor dry soil but can become invasive in warm, moist or favourable conditions.
<i>Sasaella ramosa</i>	Hairy bamboo	2c,5	
<i>Sasamorpha</i> spp.	A bamboo	1	May remain clump forming in poor dry soil but can become invasive in warm, moist or favourable conditions.
<i>Schoenus pauciflorus</i>	A tussock sedge	2m	
<i>Sedum album</i>	White stonecrop	4	
<i>Semiarundinaria</i> spp.			May remain clump forming in poor dry soil but can become invasive in warm, moist or favourable conditions.
<i>Senecio inaequalis</i>	Ragwort	4	
<i>Senecio squalidus</i>	Oxford ragwort	4	
<i>Saururus chinensis</i>	Asian lizard's tail	2m	
<i>Sinobambusa</i>	A bamboo	1	May remain clump forming in poor dry soil but can become invasive in warm, moist or favourable conditions.
<i>Smyrniolum olusatrum</i>	Alexanders	4,5	
<i>Smyrniolum perfoliatum</i>	Perfoliate alexanders	3,4	
<i>Soleirolia soleirolia</i>	Mind-your-own-business	1	
<i>Solidago canadensis</i>	Golden rod	1,4,5	
<i>Symphytum</i> spp.	Comfrey	1	

<i>Symphytum x uplandicum</i>	Russian comfrey	4	
<i>Sisyrinchium</i> spp.	Pale yellow-eyed grass, Blue-eyed grass	1	
<i>Tellima grandiflora</i>	Fringe cups		Garden escape that is becoming widespread. https://www.brc.ac.uk/plantatlas/plant/tellima-grandiflora
<i>Typha shuttleworthii</i>	A cat-tail	2m	
<i>Utricularia sandersonii</i>	Sanderson's bladderwort	2m	
<i>Verbena bonariensis</i>	Purple top, Argentinian vervain	1	
<i>Vinca major</i>	Periwinkle	1	
<i>Vinca minor</i>	Lesser periwinkle	1,5	
<i>Yushania</i>	A bamboo	1	May remain clump forming in poor dry soil but can become invasive in warm, moist or favourable conditions.

Invasive non-native references

- <https://www.rhs.org.uk/advice/profile?pid=479> Garden thugs: potential nuisance plants (as of 08.01.21)
<https://www.rhs.org.uk/advice/profile?pid=79> Bamboos
- Natural England (2011) Commissioned report NECR 053 Horizon Scanning for Invasive non-native plants in Great Britain <http://publications.naturalengland.org.uk/publication/40015>
C= Critical ranked taxa; U = Urgent ranked taxa; M = moderate risk taxa
- Schedule 9 Part 2 Wildlife & Countryside Act 1981 (as amended) <https://www.legislation.gov.uk/ukpga/1981/69/schedule/>
- Species selected for GB Non-native species information portal (GB-NNSIP) factsheets
https://www.ceh.ac.uk/sites/default/files/2012_-_NNSIP_Final_report.pdf
- England Biodiversity Indicators 2020. Technical Background document supporting (section) 20, *Pressure from invasive species*.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/925475/20_TB_Invasive_spp_accessible.pdf
- Invasive non-native alien plants species rules in England and Wales <https://www.gov.uk/guidance/invasive-non-native-plant-species-rules-in-england-and-wales>
- RHS (1992) The New RHS Dictionary of Gardening ISBN 1-56159-001-0
- Invasive alien species in Belgium <http://ias.biodiversity.be/species/show/74>

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Additional information

From Ref 1: Clump-forming bamboos grow in tight clumps, are less invasive and include: *Bambusa*, *Chusquea*, *Dendrocalamus*, *Drepanostachyum*, *Fargesia*, *Himalayacalamus*, *Schizostachyum*, *Shibataea* and *Thamnocalamus*.

<https://www.rushcliffe.gov.uk/conservation/treeshedgesandlandscaping/landscapingandtreeplanting/plantingguide/>
lists native trees suitable for planting in 4 areas but planting proposals for developments includes Schedule 9 invasive non-natives

<https://www.rhs.org.uk/science/pdf/RHS-Gardening-in-a-Changing-Climate-Report.pdf>

<https://www.woodlandtrust.org.uk/publications/2019/01/residential-developments-and-trees/>

Roy, H. et al. Centre for Ecology & Hydrology; Marchant, J. et al. British Trust for Ornithology; Sewell, J. et al. Marine Biological Association; Jukes, A. et al. Botanical Society of the British Isles. (2012) *Non-Native Species in Great Britain: establishment, detection and reporting to inform effective decision making*

Species established and persisting in the wild

The term 'in the wild' is widely used and generally encompasses both natural and seminatural habitats in both rural and urban environments. However, this and preceding projects (Hill et al., 2005, Hill et al., 2008) have not attempted to define the term 'in the wild' but have only included species that occur outside buildings, captivity or cultivation. This report aligns with the definition provided by Natural England with respect to 'the wild' (<http://www.defra.gov.uk/publications/2011/05/26/pb13535wildlife-countryside-act/>): 'The diverse range of natural and semi-natural habitats and their associated wild native flora and fauna in the rural and urban environments in general. This can also be broadly described as the general open environment.' The term 'established' is used for self-sustaining (reproducing) populations. A species is deemed to be 'established' if it occurs as a self-sustaining population, persisting for more than four years, not dependent on repeated reintroduction. However, it is useful to include the term 'persisting' for species, such as forest trees, that persist for more than four years but are not successfully reproducing.

Other References used

Alexander, K., Butler, J., Green, T. (2006) *The value of different tree and shrub species to wildlife*. British Wildlife 18 No 1 p18-28 <https://www.researchgate.net/publication/279898989>
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Hilliers Trees <https://www.hillier.co.uk/trees/listings/>
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RHS Plant finder www.rhs.org.uk/plants/search

RHS advice on *Phytophthora ilicis* <https://www.rhs.org.uk/advice/profile?PID=175>

RHS advice on *Prunus laurocerasus* <https://www.rhs.org.uk/advice/profile?pid=479>

RHS advice on invasive/near-invasive species <https://www.rhs.org.uk/science/gardening-in-a-changing-world/environmental-projects/ornamental-plants-environment>

Southwood, T. R. E. (1961 and 1984) http://www.countrysideinfo.co.uk/woodland_manage/tree_value.htm