

Development Management

Creating & Managing Urban Meadows



Since the end of the Second World War, Britain's wildflower meadows have decreased by more than 90 per cent. This has been due to changes in farming practice, urban expansion and development.

Although we cannot recreate traditional wildflower meadows in a short period of time, it is possible to create species rich grasslands and meadows, which are beneficial to our native wildlife in the urban environment.

There is no simple strategy for creating wildflower meadows in urban environments. The type of meadow created and method used to create and manage them will vary with conditions, habitat and budget. It is extremely important to remember that all grasslands and meadows require some form of management for them to be successful. If areas of fertile (nutrient rich) grassland are left unmanaged they will rapidly become overgrown with a few dominant species of tall grasses, nettles, docks, brambles, thistles etc. The wildflowers soon disappear as they become smothered by the more dominant species and deprived of light, water and space.

This document provides some possible solutions to creating different kinds of meadows within our urban environment.



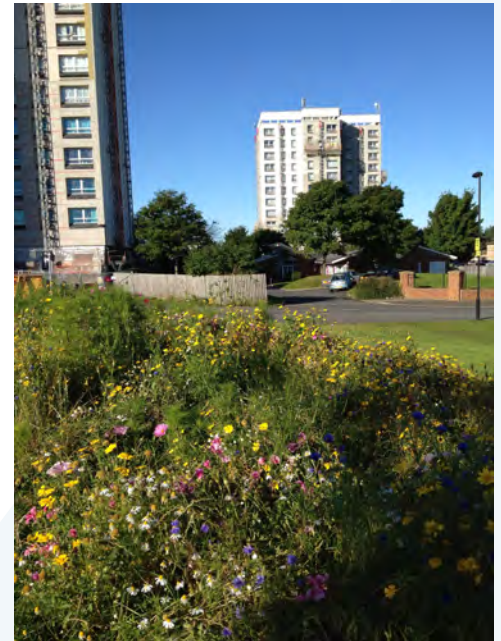
1. Converting an Existing Grassland into a Meadow

i. Overseeding

The weed seedbank in topsoils can be viable for up to 70 years and germination is triggered by disturbance of the soil and exposure to light. Therefore it is important to sow shallow to minimise disturbance of this weed seed bank.

The grass must be cut as short as possible and the entire area thoroughly raked over to remove dead grass, loose vegetation and create bare patches of soil for seeding into. The mix of seeds used will depend on the management regime that will be established upon completion of the project. The seeds should be gently raked in and then rolled or trampled in by foot.

During the first year the site should be cut frequently to maintain a grass height of approximately 10cms. This will encourage root growth while preventing the existing grasses from dominating and smothering the newly germinated wildflowers.



ii. Wildflower Plug Planting

In existing fertile grasslands the best way to introduce wildflowers is by planting plugs which is a horticultural term for a plantlet. Care must be taken to choose plants which suit the mowing regime and ground conditions. They are best planted in natural looking groups in the autumn (September to November), approximately 300mm to 500mm apart. The plants can then establish an effective root system through the winter before facing competition from existing vegetation in late spring. The soft ground conditions also make planting easier. Spring planting is also usually satisfactory, especially if the existing vegetation is temporarily suppressed by spraying with herbicide. Late spring and summer planting should be avoided unless watering can be guaranteed during the growing season.



When first planted, plugs are prone to drought due to their small root system. This is especially so when planted within an existing grassland. When planting into an existing grassed area the grass should be cut to a height of 20–50mm. Ideally a patch should then be sprayed or dug out for each plant to reduce initial competition.

In most amenity grassland areas it is best to use the taller and more vigorous wild flowers (see Table 1), as these sites are likely to be nutrient rich. Many of the wildflowers use the long grass to provide support for their rather leggy growth.

Table 1. Wildflower Plugs Suitable for Planting in Existing Amenity Grasslands

Oxeye daisy	<i>Leucanthemum vulgare</i>
Greater knapweed	<i>Centaurea scabiosa</i>
Black knapweed	<i>Centaurea nigra</i>
Meadow cranesbill	<i>Geranium pratense</i>
Musk mallow	<i>Malva moschata</i>
Field scabious	<i>Knautia arvensis</i>
Tufted vetch	<i>Vicia cracca</i>
Red campion	<i>Silene dioica</i>
Yarrow	<i>Achillea millefolium</i>
Perforate St. John's - wort	<i>Hypericum perforatum</i>
Lady's bedstraw	<i>Galium verum</i>
Red clover	<i>Trifolium pratense</i>

It must be remembered that the wildflower plugs will soon disappear if the correct mowing regimes are not incorporated.



2. Creating a New Wildflower Meadow

i. Spraying and Scratch Seeding

This method is useful for areas of existing fertile short amenity grassland. The existing vegetation should be cut as short as possible and raked off. The area should then be sprayed off with a herbicide such as glyphosate, before shallow scratch cultivation using rakes or chain harrows for larger scale sites.

Autumn seeding is best for this method of meadow creation as it provides the wildflowers with more opportunity to become established before a spring flush of weeds.



ii. Topsoil Stripped Meadows

Many wildflower sowings fail because they are grown on fertile topsoil sites, which rapidly become overgrown with aggressive weed species. One of the easiest methods to prevent this is to sow the wildflowers directly into nutrient poor subsoils. This means that the wildflowers will be subject to less competition from vigorous species and will create the effect of short grassland. Wildflowers sown onto land stripped of the top 50 -100mm of topsoil are easier to manage, as the vigour of grass and weed growth will be greatly reduced.

iii. General Advice for Creating a Wildflower Meadow

- Vegetated sites should be mown or cut as short as possible.
- Ideally existing vegetation should be sprayed with glyphosate herbicide and allowed to die back before preparation of the seed bed. Herbicide use should only be undertaken by properly certified operators.
- Seed bed preparation should be carried out on a dry day by scratch cultivation to minimise disturbance to the existing seed bank.
- Sow wildflowers from March to April or in the autumn from September to October. Wildflower seed mixes should be sown at a rate of 5g/m² if sown with grass species or 1g/m² if sown without grasses. See Table 2 for recommended wildflower mix.
- Rolling is essential to push the seeds into the soil and increase germination success.
- Future spot treatments of herbicide on invasive problem species may also be required.

Bird's-foot-trefoil	<i>Lotus corniculatus</i>
Common sorrel	<i>Rumex acetosa</i>
Field scabious	<i>Knautia arvensis</i>
Lady's bedstraw	<i>Galium verum</i>
Lesser knapweed	<i>Centaurea nigra</i>
Ribwort plantain	<i>Plantago lanceolata</i>
Meadow buttercup	<i>Ranunculus acris</i>
Meadow vetching	<i>Lathyrus pratensis</i>
Ox-eye daisy	<i>Leucanthemum vulgare</i>
Red campion	<i>Silene dioica</i>
Salad burnet	<i>Sanguisorba minor</i>
Self heal	<i>Prunella vulgaris</i>
Wild carrot	<i>Daucus carota</i>
Yarrow	<i>Achillea millefolium</i>
Yellow rattle	<i>Rhinanthus minor</i>

Note: It is important to remember that almost all wildflower meadow mixes consist of perennial wildflowers, which will only start to flower in the second year. Annual cornfield varieties can be mixed in to give some colour in the first year (See Table 5)

iv. Grasses

Grasses tend to be very competitive and it is therefore often worth sowing wildflower meadows without grass species. Grasses will naturally establish in a meadow and give a more naturalistic look to the meadow. However on exposed sloping sites erosion could be a problem due to the meadow being more open in the earlier years. Therefore if grasses are required it is recommended that the following non-competitive species listed in Table 3 are used:

Common bent	<i>Agrostis capillaris</i>
Red fescue	<i>Festuca rubra</i>
Crested dog's tail	<i>Cynosurus cristatus</i>
Meadow grass	<i>Poa pratensis</i>
Quaking grass	<i>Briza media</i>
Sweet vernal grass	<i>Anthoxanthum odoratum</i>
Yellow oat grass	<i>Trisetum flavescens</i>

3. Managing Wildflower Meadows

Virtually all wildflower grasslands need some form of management and sites cannot be left to their own devices. Without management, grasslands become invaded by vigorous weeds, rank grasses and scrub that will all out-compete the wildflowers and result in the loss of a valuable refuge for wildlife.

i. Establishment Year

During the first year of the newly created wildflower meadow it is critical to cut the vegetation down every 6 to 8 weeks to 7 -10cms. This prevents the grasses from dominating the wildflowers, promotes root growth and prevents slug damage to young plants.

The subsequent year's cuttings should follow one of the mowing regimes set out in Table 4 below.

ii. Future Management of Meadows

Every wildflower species has a particular flowering season and mixtures are often composed of spring and summer flowering species. Therefore, the long term management program and soil fertility will heavily influence the species composition of the meadow ; see Table 4.

Mowing and removing the new grass growth once a year is the absolute minimum requirement for success of a wide range of species. The timing of mowing will vary between sites, but it should be consistent from year to year. Meadows should be cut down to a height of approximately 5 – 10cms and ideally any clippings collected and removed from site.



Table 4. Cutting Regimes for Wildflower Grasslands

Cutting Time	Advantages	Disadvantages
May - June	<ul style="list-style-type: none"> ● Selectively weakens the most vigorous grasses. ● Leaves a tidy appearance during the summer and autumn. 	<ul style="list-style-type: none"> ● Only allows spring species to flower and set seed ● Heavy summer recreational use may damage less hardy species.
July	<ul style="list-style-type: none"> ● Allows many spring and early summer to flower and seed. ● The vegetation remains quite short and tidy during the later summer months which are useful for informal recreation in the school holidays. ● Some species may flower a second time in the autumn. 	<ul style="list-style-type: none"> ● Late flowering summer species will not flower or set seed
September - October	<ul style="list-style-type: none"> ● Ensures the maximum time for plants to flower and set seed. ● Provides the maximum period for late flowering species to flower and set seed. 	<ul style="list-style-type: none"> ● Large volumes of standing or flattened vegetation may build up and then need to be removed ● Weather conditions make it more difficult to cut grass

There are many other possible permutations of cutting, including monthly mowing in the early or later part of the year to create spring or summer meadows respectively. Some rougher areas can be cut every other year to leave standing cover for over-wintering insects. Finally as the sward develops and thickens some thought should be given to gap creation, deliberate damage to the surface approximating poaching by cattle, to allow new plants to establish by seed and ensure the continued evolution of the meadow community.

4. Other Ways to Use Wildflowers in Urban Situations

Below are just a few of the possible solutions for creating more diverse urban grasslands:

i. Mowing Tolerant Wildflower Meadows

These are mixed swards made up of grasses and a range of wild flowers that are extremely tolerant of cutting or grazing. The grass can be cut approximately four times during the season which suppresses weed growth, while the gaps in mowing allow some species to flower. They can be created by either seeding or plug planting the species in Table 5.

Birds-foot-trefoil	<i>Lotus corniculatus</i>
Cat's-ear	<i>Hypochoeris radicata</i>
Selfheal	<i>Prunus vulgaris</i>
Speedwell	<i>Veronica chamaedrys</i>
Rough hawkbit	<i>Leontodon hispidus</i>
Ribwort plantain	<i>Plantago lanceolata</i>
Yarrow	<i>Achillea millefolium</i>
Betony	<i>Stachys officinalis</i>
Meadow buttercup	<i>Ranunculus acris</i>
Cowslip	<i>Primula veris</i>

After mowing the cuttings can be left on site as fine clippings, but if dense they will form a mat and therefore should be removed to allow light to reach the wildflowers and developing seedlings. The mower blades should be kept as high as possible to prevent removing too much growth.

ii. Annual Wildflower Meadows

Cornfield annuals are not strictly a meadow but are in fact agricultural weeds which were once common in agricultural fields, but have now been eradicated by herbicides. However they can form stunningly beautiful patches of wildflowers. Annuals grow and flower in the same year, tolerate fertile soils and can be sown in spring or autumn.

The seeds are best sown in spring as some species are prone to frost damage, although spring sowings may result in a delay in flowering. Choose seeds from Table 6 and sow at a rate of 5g/m². After flowering has finished, the area should be cut down and dug over.

Each spring the soil must be cultivated or disturbed to trigger germination and prevent the site becoming dominated by perennial species. Failure to do this will result in a poor display the following year. Additional seed sowing in subsequent years will also be required to help build up the seedbank and maintain good seasonal displays.

Corncockle	<i>Agrostemma githago</i>
Cornflower	<i>Centaurea cyanus</i>
Corn chamomile	<i>Anthemis arvensis</i>
Corn marigold	<i>Chrysanthemum segetum</i>
Poppy	<i>Papaver rhoeas</i>

Annual wildflower displays deteriorate over time as weeds accumulate; this will either require herbicide treatment or hand weeding depending on the size of site and available manpower.

iii. Cowslip Meadow

Cowslips (*Primula veris*) can be planted into grasslands which are kept mown until early winter. Grass cutting should not start again until late May/ early June. This allows the cowslips six to eight weeks in April and May to flower and set seed. Cutting can be started after flowering and seed dispersal; thereafter the lawn can be cut as normal. Native bulbs can also be interspersed in groups amongst the cowslips to provide more variety and a longer



iv. Hedgerow/ Woodland edge

A particularly effective way to use red campion (*Silene dioica*), a native wildflower, is to plant it at the edge of woodland and hedges along with species such as cow parsley (*Anthriscus sylvestris*) and foxglove (*Digitalis purpurea*). These plants are very easy to grow and will tolerate competition from other plants and shady conditions. Their vivid flowers can create a solid mass of colour in May and June and can be cut back any time after flowering.

It should be noted that foxglove is a biennial and will only flower on the second year. It is therefore dependent on setting seed to be successful in future years and can often be variable in its success rate.

V. Yellow Rattle

Yellow rattle is an attractive, semi-parasitic, grassland annual. In the past it was a serious pest for farmers as it weakens grasses and as a result can reduce hay yields by as much as 50%. In a landscape or garden context however, this suppression of grass growth is welcomed as it produces a better display of wild flowers and eases the mowing required.

Yellow rattle germinates in March, flowers in June, and sets seed in July. At the end of each growing season as the annual yellow rattle plants die away they leave behind gaps into which new wild flowers can establish. As a result, wild flower seed sown into an existing sward will establish more readily in areas where yellow rattle already does well.

Yellow rattle establishment can be unpredictable and plant numbers may take two to three years to build up. Yellow rattle will not thrive in all grassland; the most suitable sites for yellow rattle will be managed grassland of low to medium fertility that contains a balanced sward of finer grasses not dominated by coarse or vigorous grass.

Yellow rattle seed must be sown in the autumn as it needs prolonged chilling through the winter to trigger its germination the following spring. If successful, the young plants will soon attach themselves, via their roots, to nearby grasses and other plants to extract nutrients from them. Yellow rattle may be sown as a component of meadow mixtures on to a prepared seedbed. First year meadow management_(mowing) can compromise seed set of yellow rattle. To be sure of getting yellow rattle in the second year, it is best to re-sow yellow rattle in the autumn of the first year (as above). Where cornfield annuals have been sown as a 'nurse crop', yellow rattle has more opportunity to self-seed

Cutting or grazing between April and mid July should be avoided, as it will eliminate yellow rattle by preventing it from flowering and setting seed.

Yellow rattle populations tend to fluctuate in meadows and often 'move' about from year to year as a reflection of the balance of health of the yellow rattle plants and their host plants in any one patch.

Vi. Native Bulbs

Plant native bulbs such as daffodils, snowdrops, bluebells, and fritillaries. These should be planted in random drifts in the autumn at a depth of 3 or 4 times the height of the bulb. Wild primrose plugs can also be planted amongst the bulbs for further variety and colour.



