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How-to-guide

Creating and restoring meadows in local communities and gardens

How to transform grassy areas into semi-natural grassland

National Biodiversity Data Centre
A Heritage Council Programme

All-Ireland Pollinator Plan
www.pollinators.ie

How to transform grassy areas into semi-natural grassland

The term **meadow** is used to refer to areas of **semi-natural grassland**.

These habitats are nutrient-poor and flower-rich and are traditionally managed by low-intensity farming. They can also be created in other locations by cutting and lifting (removing) grass at the right time and frequency. Meadows are hugely valuable for biodiversity, featuring a variety of native wildflowers and grasses. They support a vast range of life above and below ground, including pollinators.

You can create meadows on any scale, from a tiny corner of your garden to a large open space in your community. To do this, you don't need seeds from a packet. All you need is patience, time, and a willingness to change the way you manage and cut the grass.

Increasing the number of meadows on the island of Ireland will significantly help biodiversity, contribute to carbon storage, and leave the legacy of this vital habitat for future generations.

Irish meadows have undergone catastrophic declines

Semi-natural grasslands are among the most threatened habitats in Ireland, with huge losses taking place almost unnoticed. In the Republic of Ireland, surveys conducted by the National Parks & Wildlife Service in the past 15 years have shown losses of approximately 30% of the best quality semi-natural grasslands over a 6-year period.

In the UK, over 97% of meadows have disappeared since the 1930s. These are staggering losses, with a huge impact on the rich biodiversity that relies on these habitats. If we want to address the biodiversity crisis, it is vital that we recognise the value of meadows and take steps to restore them where we can.

Semi-natural grassland

Why do meadows matter?

- Meadows can be incredibly rich in native flowers. According to Plantlife in the UK, a typical meadow can be home to 570 flowers per square metre on a single day in early summer.
- Data from Plantlife UK also suggests that the plants in a typical meadow can support nearly 1,400 species of invertebrates; this is a vast army of bees, bugs, beetles, flies, spiders, grasshoppers, butterflies, and moths. Many of these insects are pollinators, which we rely on for the survival of our crops and wild plants.
- What we see above ground is only a fraction of the biodiversity a meadow supports – meadow soils also support an incredibly diverse range of organisms.
- Natural meadows can store 500% more carbon than fields dominated by one grass species.
- The deep roots of meadow plants like Knapweed and Bird's-foot Trefoil can stabilise soil, store carbon and bring up valuable minerals for livestock to eat.
- Due to their rooted soils and permanent cover, meadows provide good conditions for the uptake and storage of flood water. They also protect water quality by trapping sediments and nutrients and ensuring they don't leach out of the soil.
- Research shows that having exposure to landscapes such as meadows improves our connection to nature and wellbeing. Studies show that the act of viewing a flower brings direct beneficial psychological effects, including a lowering of blood pressure and a reduction in stress levels.

What is a meadow?

Traditional meadows contain a knee-height mix of wildflowers and soft grasses.

A meadow is a habitat known by ecologists as **semi-natural grassland**. This means that its existence is dependent on some human management. On the island of Ireland, a meadow left to its own devices, without any management, would eventually regenerate into woodland.
Meadows are traditionally associated with low intensity agriculture. They are areas that are farmed without the application of significant quantities of nutrients (chemical fertiliser, slurry) or herbicide.

Typically, they will not have been ploughed or re-seeded in recent times. As a result, they support a variety of wildflowers and grasses that cannot thrive in more intensively managed areas. In agricultural settings, they are managed either as hay meadows (through mowing) or pastures (through grazing). In both cases, there are two important management considerations:

1. Meadows must be 'rested', ideally from April-July. This allows plants to flower and then set seed for the following year, resulting in a more diverse flora over time.
2. The nutrient content of the meadow must be reduced. This can be done by harvesting as much vegetation as possible after the flowering season, either by mowing and baling the hay, and/or by grazing with livestock. This will reduce nutrient levels in the soil, and result in a more diverse flora as it allows wildflowers to compete with more dominant plants.

Traditional management of hay meadows:

Vegetation is allowed to grow until it is cut for hay in late July. After the hay has been collected, the meadow is grazed for a few months during autumn and winter, usually by sheep or cattle. Over winter the animals are fed hay from the meadow. In early spring, the animals are removed, and grasses and flowers are allowed to grow again until the next hay cut in July. This cycle of growing, cutting, and grazing allows wildflowers to flourish.

Traditional management of pastures:

Grazed by a small number of animals which are moved around throughout the year. This low-level grazing allows pastures to support wildflowers without a hay cut. Farmers aim for quantities of livestock that will clear most of the vegetation without damaging the soil or allowing scrub to encroach. The types of flowers that appear will differ depending on whether the pasture is wet or dry.

Alternative management - creating meadows in gardens and communities:

You don't need livestock to create a meadow. By mowing at the right time and removing grass cuttings, they can be created in any grassy environment including gardens, parks, community spaces or roadside verges.

"In a meadow, summer is a glorious time – the flowers of the grasses swaying in the wind, in varying shades of green. The dabs of bright colour from the grassland flowers such as Clovers, Oxeye Daisies, Knapweeds and Orchids. The fragrance can be magnificent, and the sound is something to cherish – the rasping of grasshoppers, the buzzing of bees and other insects, and the chirping of birds"

Different types of meadows on the island of Ireland

Just as there are different types of woodlands and wetlands, there are different types of meadows (semi-natural grassland) on the island of Ireland. Broadly, a meadow can be **wet** or **dry, acidic** or **calcareous**. The type of meadow depends on several factors, including the soil, geology, climate, and past management.

There are four main types of meadows (semi-natural grassland) found on the island (Heritage Council's 'A Guide to Habitats in Ireland', Fossitt, 2000).

Dry calcareous and neutral grassland

These are found on lime-rich or pH neutral soils, typically managed by grazing, e.g., the Burren. They can be very species rich, with a wide range of flowers and grasses.

Dry meadows and grassy verges

These include areas managed by mowing, and those which are all but abandoned. Taller species can thrive here. They include meadows in the Shannon callows, or areas along railway embankments.

Dry-humid acid grassland

These grasslands are acidic, and the species found here are adapted to low-nutrient, acidic soils. They are typically found in uplands, but the Curragh is an excellent example.

Wet grassland

These are the most common type of semi-natural grassland in Ireland. Here you will find species adapted to wet soils, such as rushes, sedges, and Flag Iris.

Ornamental meadows

As more people learn about the value of meadows, there is more interest in restoring this important habitat. Wildflower seed mixes are easily available online and in garden centres, but unfortunately the terms 'wildflower' and 'meadow' are often misunderstood.
There is currently no regulation over the content of wildflower seed mixes or 'seed ball' type products on the island of Ireland. Many have been found to contain non-native species and can inadvertently introduce invasive species. Using wildflower seed mixes to sow colourful flowers in gardens, on roundabouts or along road verges will not result in species-rich grassland. These flowers may provide some pollen and nectar, but they are nowhere near as valuable as the naturally occurring native wildflowers that our pollinators have evolved alongside.

Ornamental meadows are managed differently, requiring ground clearing, soil cultivation and sowing seed each year (which can be expensive). Wildflower seed mixes often don't include grasses, which means that they are exceptionally colorful, but don't bear any resemblance to a semi-natural grassland. Many grass species provide crucial food for insects such as butterflies, and in a real meadow, grasses account for the majority of the vegetation.

Meadows are created through careful long-term management, not from seeds in a packet.

Meadow (naturally restored)	Ornamental meadow (sown from a packet)
Semi-natural habitat	Style of gardening
Most attractive to wildlife	Most attractive to humans
Exceptionally high value for biodiversity above and below ground	Low biodiversity value – mainly benefits flower-visiting insects
1,400 species of invertebrate feed on the leaves, stems and roots of native meadow wildflowers (Plantlife UK)	Around 40 insect species are supported by a typical annual 'pollinator mix' (Plantlife UK)
Contains a native mix of grasses (many of which provide food for insect, bird and mammal species) and perennials - looks mainly green	Often doesn't include grasses, rich in non-native annuals like cornflowers and poppies – very colourful but of minimal food value to many species of insect, bird and mammal
Contains native wildflowers growing in the right place	Often contains non-native wildflowers that may not be adapted to the area
Can take years to naturally develop and become flower rich	Grows straightaway (if the soil conditions are right)
Requires annual management	Requires annual management
No risk of introducing invasive species	Risk of introducing invasive species
No risk of polluting the genetics of the native flora	Risk of polluting the genetics of the native flora, if seed is imported from other regions
Relatively cheap - no seed required	Can be expensive to purchase and resow annual seeds
Recommended by ecologists as a biodiversity action	Not recommended by ecologists as a biodiversity action

Local Soil - Local Seed

Our soils often contain a wonderful seedbank of all our native seeds sitting underground waiting for their chance to pop up and grow!

This seed store is free – all you need is patience to watch it appear. Across the island of Ireland, there are many examples of how a change in grass management can produce results within even a few years, with Pyramidal Orchids and Bee Orchids rising up amongst the vegetation of our road verges.

This can keep happening if we choose natural restoration - patience over packets.

Creating and managing meadows - quick questions

What is the most important action I can take to help biodiversity?

✓ If you already have a meadow – protect it! Otherwise, consider creating and maintaining an area of meadow.

How big should a meadow be?

✓ It can be as small as 1m2 in your garden. Any areas returned to meadow are valuable, and all are managed in the same way. Rare species, like Orchids, will be spread more thinly, so the larger the area, the more chance it will become home to a greater diversity of native plant species.

Where do I buy the wildflower seed mix?

✓ You don't. Wildflowers appear naturally with the correct management. Our soils contain a wonderful seedbank of our native seeds, just waiting for their chance to grow. Patience – not packets!

What will the meadow look like?

✓ It won't look like the front of a packet of colourful 'wildflower seed mix'. See page 17, showing how a meadow progresses over time.

How long will it take?

✓ In less fertile areas, results can be seen within 1-3 years. If your soil is very fertile, to restore a regularly mown area of grass into a flower-rich meadow can take from 7-15 years. However, biodiversity will benefit above and below ground from year one.

Do I just stop mowing and ignore it?

✓ No, meadows are semi-natural habitats. They can only exist with correct management.

Do I need specialised equipment?

✓ You need to have a way to cut the grass in September and remove the cuttings.

Can a species-rich meadow be created in any location?

✓ Please use the flow chart on page 9 to ensure you are choosing the right initial location within your community or garden to maximise your chance of success.

Do all meadows have knee-height vegetation?

✓ **Long-flowering** meadows have knee-height vegetation, and most closely resemble a semi-natural grassland. You can also have a **short-flowering meadow** (ankle-height vegetation). In many cases, this may be a more appropriate choice of meadow (see flowchart).

Is it worth the effort?

✓ Yes. Creating and managing a meadow requires effort. However, there is no better way to help biodiversity and leave a positive legacy for future generations.

Flow chart

Do you have an existing meadow?

Yes → Protect and cherish this important habitat. IT IS FRAGILE - be very careful of management changes
See SECTION A

No ↓

Do you want to turn an area of regularly mown grass into a meadow?

Yes ↓

Do you have a suitable location - sunny and with low soil fertility?

No →
- Consider an alternative biodiversity action, e.g. planting native trees or orchards
- Maintain original management, perhaps incorporating spring flowering bulbs in certain areas to help biodiversity
- Have the patience to go through several years of mowing and lifting to reduce the soil fertility

Yes ↓

Check if you also meet all of these criteria:

- ✓ You are happy that the meadow will look untidy at times, especially in late summer
- ✓ Plans are in place for how to cut the long grass in September and lift those cuttings
- ✓ Plans are in place for how to remove grass cuttings e.g. composting

If on public land, you also need to meet all these criteria:

- ✓ Permission from the local authority
- ✓ Public support for the chosen location
- ✓ Area accessible for mowing
- ✓ Low risk of litter/dog fouling
- ✓ Regular litter picking arrangements
- ✓ Potential to mow margins and paths, and use signage to show management is deliberate

No → Manage as a short-flowering meadow
See SECTION B

Yes → Begin managing as a long-flowering meadow
See SECTION C

→ Check annual species richness - improving by year 5

No ↓

No, choose an alternative

Yes ↓

Manage as a long-flowering meadow
See SECTION C

You are returning a vital semi-natural grassland habitat

Section A

Existing meadow

This is an incredibly important habitat for biodiversity that should be treasured and protected.

- Regardless of how small an area you have, you should maintain and protect this important habitat
- Existing meadows can often be found on farmland, often without the farmer realising its value to biodiversity.
- Protect, cherish, and enjoy what you have, and know you are leaving an important legacy for future generations

Existing meadows are incredibly fragile. If you are fortunate enough to have an existing meadow on your land, you need to carefully maintain your management to protect it. One application of fertilizer or lime, or one season of mulching grass back in instead of lifting off, and it can disappear. When this happens, it can be restored, but it can take many years. The wildflower seeds that have built up naturally in the soil over many years are dependent on you protecting the conditions that allow them to grow and flourish each year.

What does an existing meadow look like?
A recent project was set up by the National Parks and Wildlife Service to celebrate this habitat in Ireland: www.greatirishgrasslands.ie The 'Grasslands Trail' is a network of publicly accessible grasslands. All these sites are managed sensitively, with nature conservation and grassland diversity in mind. Visit the website to see the location of current sites in the Trail.

Recent Irish research shows that semi-natural grasslands are particularly important for conserving pollinators, including rare species. Published in Ecology & Evolution, 2022

Section B

Short-flowering meadows

Definition: Grassy areas that are cut every 4-6 weeks, with the cut removed. This gives a succession of naturally occurring wildflower seeds a chance to grow, such as Dandelion, Clovers, Bird's-foot-trefoil, and Selfheal. These flowers are usually removed by regular mowing, but they are an important food source for pollinators and other creatures.

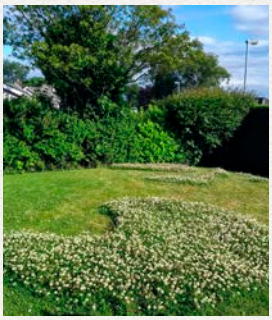
A short-flowering meadow provides benefits for biodiversity while avoiding some of the challenges of managing long-flowering meadows.
Grass in urban areas is often very fertile, making short-flowering meadows more suitable for many urban locations. In a local community, it is generally better to have a small number of well-managed long-flowering meadows and larger numbers of short-flowering meadows.

How to manage a short-flowering meadow

FLEXIBILITY IS KEY: Manage short-flowering meadows in a way that suits you

- ✓ Arrange a cutting schedule to maximise the number of flowers. It is typically best to cut after Dandelions in April, in early June and in mid-July. Take part in campaigns like #LetDandelionsBee and #NoMowMay

- ✓ The 4-6 weeks cutting schedule is a guide – identify what works best for your area
- ✓ If grass cuttings are lifted, your short-flowering meadow will gradually become more flower-rich on its own. If you choose to mulch the grass back in, you are repeatedly fertilising the soil, and your meadow will not become flower-rich.



- ✓ Don't use herbicides. These chemicals can negatively impact soil biodiversity. Remove any problematic weeds manually, but remember many plants we traditionally regard as 'weeds' (like Dandelions) are important sources of food for pollinators.
- ✓ Mow around where flowers appear, giving them a chance to grow. Be as creative as you like – mowing patterns, spirals, shapes
- ✓ If on public land, use signage to show your reduced mowing regime is deliberate
- ✓ If you don't see any flowers after a few years, return to the original management and consider a new location.

Important: Your short-flowering meadow may have to be cut when it is full of flowers and is buzzing with insects. This can be difficult, but flowers will reappear again a few weeks later. Be aware of public expectations and use signage where necessary to avoid any negativity around cutting on public land.

Section C

Long-flowering meadows

Definition: Grassy areas that are cut once a year, with the cut removed. These meadows are cut in early September as this gives the seed a chance to set. If correctly managed, they gradually become more diverse as semi-natural grassland returns. This can take up to 15 years. Sites with very fertile soil may need additional cuts/management actions.

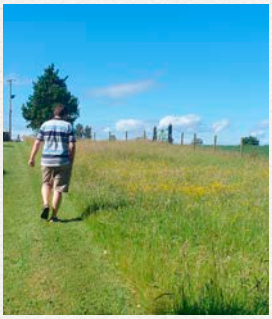
In a local community, it is generally better to have a small number of well-managed long-flowering meadows and larger numbers of short-flowering meadows (Section B). Some grassy areas may have a mix of long-flowering meadows, short-flowering meadows, and regularly mown grass.

Creating and managing a long-flowering meadow requires effort. In local communities, it can be beneficial to work with your local authority where possible.

There are generally two types of areas where this type of management can take place:

Long-flowering meadow: larger areas of grass which are cut once a year in September. Leave cuttings to lie for a few days, then gather and remove.

Long-flowering margin: a smaller area (such as a roadside verge) where you regularly mow just the width of one mower (around 50cm wide) on one side of the verge, and manage the rest as a long-flowering meadow. This often takes place along paths or roadsides.



In both cases, you will need to:

1. Choose the right location
2. Manage your long-flowering meadow or margin properly:
   - A Remove tall weeds between March and August
   - B Cut in September and remove the grass
   - C Communicate your actions in public areas
3. Be patient and manage human expectations

1 Choose the right location

Restoring semi-natural grassland will take several years and requires patience. By choosing the right location you make that journey shorter and easier

Only create a long-flowering meadow or margin if your site meets these criteria:

- ✓ Sunny, open location
- ✓ As far as it is possible to know, the soil fertility is not extremely high – e.g. on thinner soils.
- ✓ You accept that the meadow will look untidy at times, especially in late summer
- ✓ Plans are in place for cutting the long grass in September and lifting those cuttings
- ✓ Plans are in place for removing and disposing of the cuttings e.g., composting

If on public land, you also need to meet these criteria:

- ✓ Gain permission from the local authority (if relevant)
- ✓ Gain public support for the development of a meadow or margin in the chosen location
- ✓ The area is easily accessible for mowing
- ✓ The area is suitable for longer grass (low risk of litter/dog fouling)
- ✓ Regular litter picking arrangements are in place
- ✓ There is potential to mow margins and paths through the grass to allow the public to enjoy the meadow and show the management is deliberate
- ✓ Consider using signage to show deliberate management

- ✓ For larger areas, the annual cut may need to involve an arrangement with a local farmer, or dedicated equipment such as a zero grazer
- ✓ For larger areas, cuttings will be significant and their disposal (e.g. through composting) needs to be considered in advance

2 Manage your long-flowering meadow or margin properly

A Remove tall weeds between March and August

This is a step that is often overlooked and can lead to problems with public perception and meadow development.

- ✓ Between March and August, you should remove larger, fast-growing plants (Docks, Nettles, Hogweed, Ragwort, Thistles.) If not removed, they may come to dominate the meadow. In fertile soils, fast-growing rough grasses and other plants take advantage of the nutrients and grow quickly, at the expense of slower-growing wildflowers. Anything taller than knee-height should be manually removed in the first years as the meadow is established. Over time, the number of fast-growing plants that need to be manually removed greatly reduces each year.

Question: Aren't these plants good for biodiversity?

Yes, and if possible, you should leave small patches in suitable locations outside your meadow. In a meadow they may come to dominate.

Most of the large Docks in this meadow should be manually removed

B Cut in September and remove the grass

Long-flowering meadows or margins are cut once a year in September. It is vital that the grass is removed. Flower-rich meadows will only develop on sites with low soil fertility. Removing grass cuttings each autumn allows the soil fertility to slowly decrease. This gives flowers a chance to compete with the more dominant grasses. The less fertile the soil, the more flower-rich your meadow will be.

Why September?

August's seeds feed next year's bees!

Most flowers will have dropped their seeds back into the soil by early September, making this the ideal time to cut and lift the grass.

Flexibility is fine!

Later cutting: Cutting later than September is fine, but the weather may make things more difficult (it is easier to cut when the ground isn't too wet). Better weather also gives the cut grass a chance to dry - it's much easier to lift dry grass.

Earlier cutting: If it's not practical to cut in September, cutting in August is also fine (hay meadows are traditionally cut in late July). September is the best time, but this is simply a guide. With long-flowering meadows you should be flexible, pragmatic, and do the best you can.

Extra cuts: If the grass growth is very strong and vegetation is falling over under its own weight, cut sooner, e.g. July and again in September. After a few years, as soil fertility reduces, this earlier cut will no longer be necessary. When converting their land into long-flowering meadows, local authorities often need to cut more than once in areas of particularly fertile soil such as road verges or amenity areas.

Looking dead? Remember - August's seeds feed next year's bees!

If possible, let the September cut lie for a few days. This allows more seed to drop.

How should I cut?

- Small areas where grass growth is not very thick can be cut with a scythe or strimmer. In gardens, most lawn mowers can cope with small areas of longer grass. Initially set the blades at their highest setting and then do a second cut at a lower height.
- Larger areas may require specialised equipment, or an arrangement with a local farmer to cut and bale the grass.
- In larger areas, cut out from the centre. This gives mammals and birds in the meadow a chance to escape.
- If possible, let the cut lie for a few days. This allows more seed to drop and gives any insects a chance to escape. A dry cut is also easier to lift, particularly if it is done manually. If this is not practical, it is fine to cut and lift straightaway.

Idea: Organise a community hay making weekend. It may be possible to make this a Heritage Week activity, perhaps even collaborating with local vintage machinery enthusiasts.

What kinds of specialised equipment have local communities been using for cutting larger areas?

Scythe: The scythe is a handheld tool that was traditionally used for cutting hay meadows on farms in the past. Many groups are now helping to keep this traditional practice alive by getting in skilled operators to demonstrate it as part of community events when the meadows need cutting (which happens to tie in nicely with National Heritage Week in the Republic of Ireland!).

Small machinery: For cutting small to medium sized meadows, this includes handheld machines such as strimmers and brushcutters. The brushcutter is similar to the strimmer but it has a steel blade for cutting and is therefore better able to manage stronger vegetation.
A power scythe is a walk behind two-wheeled tractor with a flat cutting bar attachment on the front. This piece of equipment is ideal for cutting meadows of different sizes. The cutting bar attachment can be changed, and other attachments for gathering the equipment put on such as a hay rake, buck rake and even a mini-baler. This is a specialist piece of machinery and is more suited for contractors, local authorities, and other groups who have large areas of meadow to manage and can justify the expense of operating it.

Zero Grazer: Operated on the back of a tractor and is commonly used by dairy farmers to cut and collect grass as feed. Most of the zero grazers used on farms are too big for community meadow management. However, there are new, small scale Zero Grazers on the market that can be suitable for local authorities to manage meadows on roadsides, roundabouts, parks, etc. This has famously been trialled by Ennis Tidy Towns and they have identified many benefits for Local Authorities.

Please note that all the equipment and machinery mentioned above can cause serious injury if not used in a safe manner. They should only be operated by trained and experienced personnel and with proper consideration given to the necessary health and safety measures

Should we cut the whole meadow at once?

It is helpful to leave small sections entirely uncut, and to rotate these each year. This provides a habitat for overwintering insects and mammals to nest. However, vegetation allowed to build up over multiple years could become a fire hazard in hot weather. Be careful to avoid this.

Idea: While it is best to cut most of your long-flowering meadow annually, you could cut one third each year if you are struggling to deal with the volume of grass cuttings.

What to do with the grass cuttings

This is the biggest obstacle to creating more meadows on the island of Ireland. The ideal situation would be to use personal or community composting facilities, but this is not always possible, given that large volumes of grass alone cannot be composted. You should talk to your Local Authority to see whether they can help.

Community composting: offers a good solution and also creates a local source of peat free compost. However, you will need to balance the grass cuttings with brown material (hedge prunings, wood shavings, autumn leaves, shredded cardboard or paper) otherwise it will become slimy and smelly. You will also need to have a suitable location and use a large compost bin/tumbler, such as those used on allotments.

Idea: use some cuttings as mulch around the base of newly planted trees

Future: New and innovative solutions for grass cuttings need to be explored and tested. Biodigester trials are also necessary to identify their cost effectiveness and realistic potential into the future. As these occur, where possible, this knowledge will be shared with local communities.

C Communicate your actions in public areas

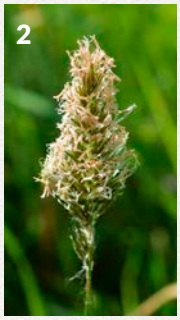
- ✓ Use signage to explain your meadow management is deliberate. There are various free signage templates available on the resources page of the All-Ireland Pollinator Plan website (https://pollinators.ie/resources/)
- ✓ Keep the outside edge of your meadow short to indicate the area is still managed. You can also cut paths through the grass, allowing the community to enjoy the meadow.
- ✓ Consider installing a seat for people to enjoy this space.

3 Be patient and manage human expectations

When creating a new long-flowering meadow, it will pass through different stages. Sometimes it will look a bit untidy. Be patient and manage each stage properly. Many areas will contain large robust grasses in the first few years. In some cases, it can take 7-15 years to restore a more flower-rich habitat.

Three important things to remember:

- Long-flowering meadows will never look like the front of a wildflower seed packet as these are not representative of real meadows or grasslands.
- Regardless of how it looks to a human, your meadow will be better for biodiversity from the moment you start.
- Grass is good! Long-flowering meadows contain many soft grass species like Crested Dog's-tail (1) or Sweet Vernal Grass (2). These species are great for biodiversity. You might even be lucky enough to have Quaking grass (3). If your meadow has lots of soft grasses, celebrate them!



Progression of the long-flowering meadow at the National Biodiversity Data Centre

Year 1 & 2: very grassy

Years 3-5: becoming more flower rich

Years 3-5: becoming more flower rich

Year 6: the first orchid appeared!

What stage is my meadow at?

To assess the progress of your long-flowering meadow or margin, randomly select a few areas and mark out a 1m square plot. Then, count the number of different plant species in that square and/or the total number of flower heads. This will give you an indication of how flower-rich your meadow is. Repeating this exercise in future years will allow you to track your progress.

You can see the stage your meadow is at using the categories below.

Species-poor

1-5 plant species/m² (including grasses and sedges)

Large robust grasses and lots of fast-growing plants like Thistles, Nettles, Docks, Hogweed, Ragwort. The most likely cause of this is high soil fertility due to fertiliser application, or a prior cutting and mulching regime. Remember, this is still a better habitat for biodiversity than short mown grass as it will immediately support a range of wildlife above and below ground.

- ✓ Move to 2-3 cut and lifts per year for the first few years (February and September, with an extra cut in July if necessary)
- ✓ Remove large plants across the season - Docks, Nettles, Hogweed, Ragwort, Thistles
- ✓ If the meadow remains very grassy after a number of years:
  - Return to the original management (regular mowing) and consider an alternative location for a long-flowering meadow
  - Manage it as a short-flowering meadow
  - Persevere and manage public expectations (where this is necessary)

Species-sparse

6-10 plant species/m²

Plants like Oxeye Daisy and Buttercup are likely to be dominant. Your meadow is moving in the right direction.

- ✓ Persevere with the annual cut and lift
- ✓ Continue to remove large fast-growing species - Docks, Nettles, Hogweed, Ragwort, Thistles
- ✓ Consider adding Yellow-rattle seed from a local source (page 20).
- ✓ If your long-flowering meadow is on public land and has severe public opposition, manage it as a short-flowering meadow

Flowers that you can expect to see in your meadow as it develops

Species poor

Moderate species-richness

11-15 species/m²

Species richness gradually increases and plants like Red Clover, Bird's-foot-trefoil, Selfheal, Vetches and Knapweed will appear, perhaps some orchids like the Common Spotted Orchid or the Pyramidal Orchid. These meadows often contain soft grasses like Sweet Vernal Grass and Crested Dog's-tail.

- Continue with the annual cut and lift
- Continue to remove large fast-growing species (you shouldn't need to do this as often now)
- Once established, you could gradually add additional species by collecting seed from other pollinator-friendly wildflowers growing in the local area and adding as plug plants (page 21). In most cases this will not be necessary – the meadow will develop on its own.

A key action to help the rare Large Carder Bee is to return meadows

Species-rich

15+ species/m²

Your long-flowering meadow or margin has begun to settle down and has a good range of native grasses and wildflowers. It will become more diverse over time on its own. It can take at least 7 years to reach this stage, and it can be up to 15 years before the meadow reaches its full potential. You need patience, but these meadows are amazing resources for biodiversity and a fantastic legacy to leave for nature and future generations

- Maintain management
- Protect this habitat – it requires significant effort to reach this stage but is very fragile and sensitive to management changes, e.g. the addition of fertiliser or mulching instead of lifting the grass cut
- Celebrate and enjoy what you have created

Species rich (can take from 7-15 years to reach this stage)

New long-flowering meadow in Tramore - now home to the rare Large Carder Bumblebee.

Yellow-rattle – the meadow maker

Yellow-rattle (*Rhinanthus minor*) is an annual plant. It has an unusual lifecycle in that it is **hemi-parasitic**. This means that, after the seeds germinate in early spring and their roots develop, they attach to the roots of plants growing nearby, especially grasses. The Yellow-rattle then draws water and nutrients from its host plant. It is estimated that Yellow-rattle can suppress the growth of grasses by as much as 60%, and so is sometimes called the 'meadow-maker'.

Why plant it

- ✓ It suppresses grasses and gives other wildflowers a fighting chance to compete
- ✓ Yellow-rattle itself is an important food plant for pollinators, especially bumblebees

How to get Yellow-rattle to grow in your meadow

Yellow-rattle can be hard to establish. If you decide to add it to your meadow, it's very important that you follow **all** of this advice.

- Use fresh seed – it does not store well. Ideally, harvest from a local meadow in July-August. Make sure you have permission and only collect a little. Keep the seeds in a dry envelope until you're ready to sow them. If you decide to buy Yellow-rattle seed, make sure it has been collected in Ireland and is fresh. It should be as local to you as possible. Use a reputable supplier.
- Use in the same year you collected the seed. Sow from late September until the end of October. Yellow-rattle needs around four months of temperatures below 5°C to germinate.
- Sow onto soil. Expose some bare soil in your meadow using a rake (known as **scarification**). Scatter the seeds on the soil surface. It is vital that the seed has direct contact with the soil. Do not sow onto a large area of bare soil, as Yellow-rattle must attach to the roots of other plants to grow.
- When trying to establish Yellow-rattle, you need to temporarily adopt a specific mowing regime. Yellow-rattle usually germinates from February-April, so short grass at this time gives the seedlings a chance to grow.
  - Cut and lift in September as usual. You can sow seed after until the end of October.
  - Keep the grass to ankle height across the autumn and winter so it's not already long in spring. Cut and lift as necessary up until February.
  - The following year, only cut the meadow after the seed has dropped (early September).

If your Yellow-rattle doesn't establish, it is probably because:

- The soil is very fertile
- The seeds are not fresh
- It has been planted too late
- You have not scarified the soil properly. Make sure to do this in a way that allows the seeds direct contact with the soil. If you simply scatter them in an existing meadow without scarifying, Yellow-rattle won't grow.

Collecting local wildflower seed and adding as plug plants

Adding Yellow-rattle can be useful. Other than this, we strongly recommend allowing your meadow to develop on its own. Watching nature at work is part of the journey of having this habitat. Wildflowers will appear on their own in conditions that suit them.

> *"The greatest joy is seeing what flowers pop up each year"*

However, depending on the initial conditions of your site, your meadow might be slow in becoming flower rich. In these cases, you could consider collecting **local** pollinator-friendly seeds and adding them to your existing meadow as plug plants.

What are plug plants?

Plug plants are a great way to get new species established in your meadow. It gives them a chance to set their own seed and, if they're happy, to spread. You can add seed directly, but while it requires more effort, growing the seed in a pot and adding it to the meadow as a plug plant can increase your chance of success.

You can add plug plants of lots of species, but pictured are some we recommend: they are high in pollen and nectar, flower at times of the year when insects most need them, and some can be slower to establish naturally.

How to add plug plants to your meadow

- Collect seed in late summer from any of these native flowers that you find growing wild in your locality
- Initially grow the seed at home, or in a community polytunnel/allotment
- Plant your seed in small pots in peat-free compost until they are at least a year old - at this stage they will be well developed and more likely to grow in the existing meadow
- Give the plugs at least a year to establish - sow the seed in autumn, and add the plug to the meadow the following autumn
- Only use species that are adapted to your meadow's conditions. A wet-loving plant will not survive in a dry sunny site.
- Ideally plant your plugs in late summer or autumn when the soil is still warm before winter. Avoid planting from April. Plug plants are very prone to drought and will struggle to establish in the drier spring and summer weather.
- Plant in little groups to increase the chance of cross pollination and healthy natural seeding the following year.
- To plant a plug, dig out a small sod of turf and plant the plug into it, firming down the earth around the plug


Knapweed


Field Scabious


Devil's-bit Scabious


Vetches


Selfheal


Bird's-foot-trefoil


Red Bartsia


Yarrow

FAQs

Where can I find good examples of meadows so I know what to aim for?

The National Parks and Wildlife Service have launched an initiative to celebrate semi-natural grasslands in the Republic of Ireland. It includes information on a *Great Irish Grasslands Trail*. These are publicly accessible sites where you can go to see excellent examples of large semi-natural grasslands. www.greatirishgrasslands.ie

Who can help create long-flowering meadows in my community?

Many local authorities have been helping and collaborating with local communities to develop meadows. It may also be possible to work with local community employment initiatives. For example, the Community Employment Programme (CE Scheme) in the Republic of Ireland is designed to help people who are long-term unemployed, or otherwise disadvantaged, to get back to work by offering part-time and temporary placements in jobs based within local communities.

I'm considering planting a small native woodland – is this better for biodiversity than a meadow?

Both habitats are important, and in a local community you should ideally have both. Establishing a meadow is more difficult but given the enormous benefit to biodiversity, it is one of the most valuable actions you can take. In both cases, do not choose areas which already have valuable semi-natural habitats, or sites with rare or protected species. If in doubt, get the advice of an ecologist.

Will some people complain about the new meadow?

Probably. Natural meadow restoration involves managing the landscape in a very different way to what we are used to. This will jar with people until it becomes normalised. One of the causes of the biodiversity crisis is our habit of tidying and 'gardening' the landscape, removing valuable natural habitats. It is important to explain to people what you are doing, whether through signage, a local newsletter, or community events. The more people that understand why meadows are important, and how they need to be managed, the more support you will gain.

Will meadows attract vermin/rubbish?

Irish studies have found no evidence that meadows attract vermin. They are most likely to be attracted by bins and food waste. Some meadows may have rubbish dumped in them, so it is important to choose your location carefully to minimise this risk. All areas require some litter picking, so make sure you arrange this regularly in your meadow.

Does the advice in this guide apply to roadside verges?

The advice in this guide applies to smaller stretches of roadside verges that are managed by the local community. Anyone managing larger expanses of verges (e.g. local authorities) should refer to the All-Ireland Pollinator Plan Transport Authority guidelines (more flexibility is required in these cases around cutting regimes, due to the large scale meadow management.)

Does the advice in this guide apply to local authorities?

No, a specific version of this guide is being developed for local authorities. The challenges councils face are slightly different, as they carry out these actions on an enormous scale, and so need more flexibility around cutting regimes

I want to restore a long-flowering meadow, but I used a commercial wildflower seed mix before realising it is better to allow natural restoration. What should I do now?

Continue to manage the area as you would a naturally regenerating long-flowering meadow. Depending on what was in the seed packet, the meadow may contain non-native species until it settles down. Often, wildflower seed mixes contain annuals, so are very colorful in the first year and less so in subsequent years. Natural meadow regeneration moves in the opposite direction – slowly and sustainably becoming more flower-rich.

Will our meadow be used by ground nesting birds?

It is possible that your new meadow may be used by ground nesting birds, like Skylarks or Meadow Pipits. They often nest in longer grass (ca 20-50cm long). Both are Birds of Conservation Concern in Ireland. If they are known to be in your area, or you suspect that they are nesting in your meadow, it is very important that you don't mow until the autumn. These birds generally nest from April until early August. Mowing these meadows during their breeding season could destroy nests, eggs or chicks, or expose them to predators.

We have too much Ragwort – what should we do?

Keep cutting and removing. Ragwort is only problematic in situations where it is going to be chopped into hay for livestock. It is an important plant for many insects, including Cinnabar and Burnet moths. If the Ragwort is causing issues, cut in July and again in September until it is reduced. This will help reduce seed dispersal.

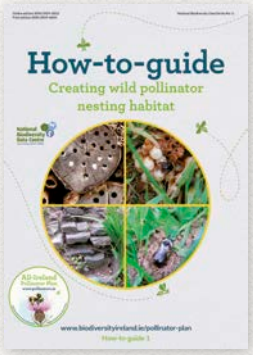
Our area is an important site for overwintering geese. Should we have a long-flowering meadow?

If your area is used by Brent Geese or other wintering waterfowl and waders, you should manage it for this species and should not change the species composition or management of these areas. Brent Geese and other wintering birds may feed on some playing fields, pitches, parks and green spaces. They have travelled thousands of miles to get to this island and are often faithful to their feeding sites. There may be other areas where you can have long or short flowering meadows, but it is important to balance the way we manage our landscape for all biodiversity, not just pollinators.

Are there any other good sources of information?

Plantlife in the UK provide excellent information on meadows https://meadows.plantlife.org.uk/

This booklet is one of a series of Guidelines produced to help different sectors take actions under the All-Ireland Pollinator Plan. For more information and other useful resources, please see **www.pollinators.ie**



National Biodiversity Data Centre
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About the National Biodiversity Data Centre

The National Biodiversity Data Centre is a national organisation that collects and manages data to document Ireland's wildlife resource, and to track how it is changing. Find out what biodiversity has already been recorded in your local area: **maps.biodiversityireland.ie**

Help us to build up the knowledge of biodiversity in your local area by submitting sightings to **records.biodiversityireland.ie**

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