

The case against 'wildflower' seed mixtures

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Swathes of 'wildflowers' originating from commercial seed mixtures have become a common feature on roadsides and in other open spaces, amidst a growing perception that such areas benefit bees and other pollinating insects and counteract biodiversity loss. Plants that are deliberately sown are not, of course, 'wild' and the use of these commercial seed mixtures is harmful to the natural environment: it damages native habitats and is of no long-term value to pollinators or other wildlife. Instead, flora and fauna — including pollinators — are best served by recognising and conserving *in-situ* natural habitats and adopting low-intensity management methods.

The use of 'wildflower' seed mixtures fails to address and even aggravates the real issues of biodiversity loss because:

- Packets of 'wildflower' seed mixes branded 'native' frequently contain non-native species. These displace native flora if sown in the wild. Alien species are potentially invasive and there is a risk of importing pests and diseases.
- Seeds of non-local origin — even if the species are native — introduce new genetic strains which may displace or compromise the local, naturally-occurring flora.
- Local, native species do not need to be sown. Native plants colonise suitable habitats by natural means. Sadly, many have recently been removed and replaced by beds of commercial 'wildflowers'.
- Pollinators and other invertebrates need a complex set of conditions to survive. Simply introducing colourful flowers does not meet their requirements. At best, it provides a short-term food supply for some common insects that are not threatened.
- The typical mix of plant species contained in 'wildflower' seed packets is never found growing together in the wild. Natural habitats form in response to local conditions such as soil, climate, water availability and historical factors. The resulting plant communities are adapted to their conditions, unlike ad hoc introductions.

Nature conservation is best served by working with what already occurs naturally and by avoiding excessive disturbance, rather than by attempting to introduce new species. Low-intensity management methods, for example mowing grass less often, allow species already present in the soil seed bank to flower and set seed. Long established, indigenous flora and fauna should not be disturbed.



Wildflower seed mixtures do not help address biodiversity loss. Rather, they cause further disruption to what remains of the natural environment.

Background

Biodiversity loss has been well documented and there is increasing public awareness and concern surrounding it and other environmental matters. Addressing the loss of flora and fauna, and promoting nature conservation in a holistic and sustainable way, begins with understanding natural habitats and biogeography.

Native plant species occupy differing positions in the landscape. Their presence indicates the occurrence of particular combinations of environmental conditions. These conditions include the character and disposition of bedrock, glacial deposits, water availability and soil chemistry, moulded by the over-arching effects of climate and countryside management.

Natural habitats and native flora have been lost throughout most of the land area of Ireland. Species-rich wetlands have been lost through drainage. Woodlands and hedgerows have been cleared. Most of our farmable land has been converted to highly intensive livestock production, either for direct grazing or for silage production, driven by large inputs of synthetic fertilizers with Rye-grass reseeding and broadleaf herbicide application. Tillage areas are also heavily treated with biocides. Roadside verges show the signs of agricultural pollution in the form of excessive growth of coarser vegetation as the result of nutrient run-off, which then chokes the living space for less vigorous species. This homogenisation of the countryside results in a much-degraded spectrum of biodiversity as the ecological support systems of the more specialised and vulnerable plants and animals are lost.

Naturally occurring plant communities form characteristic patterns in response to local conditions. The occurrences of individual or combinations of species indicate the nature of the soil beneath and testify to the historical lineage and continuity of each site. For example, formerly widespread and familiar species such as Cowslip indicate the presence of dry, unploughed, unfertilised, lime-rich grassland. Fragments of permanent grassland still survive in long-established settings such as graveyards and old lawns and native species such as Pyramidal Orchid occasionally appear. Hedges and their roadside verges retain populations of former woodland species, such as Primrose and violets. Deep-rooting rushes are often the only surviving evidence indicating the former presence of much wetter habitat conditions now lost due to drainage.

Unravelling the factors accounting for the increasingly fragmented contemporary patterns of distribution of these iconic and less obvious species is the task of the plant geographer. Using the occurrence patterns disclosed by distribution studies to inform nature conservation and habitat restoration becomes the duty of the plant ecologist.

Wildflower Seed Mixtures

A recent trend to seed streetscapes and unutilised lands with 'wildflower' mixtures has emerged. These mixtures have become widely available through the horticulture and gardening trade, marketed as being 'wild' and of benefit to nature. Seeds which are commercially produced and deliberately sown cannot, by definition, be wild and introducing them to the natural environment does not contribute to addressing biodiversity loss.

Well-intentioned customers purchase these mixtures in the belief that they are doing some good for insects such as bees and butterflies. Some common species of pollinating insects will visit these flower beds and may benefit in the short-term, but the local occurrence of most species is dictated by a more complex set of requirements which these mixtures will do little to support. The larval stages of insects often rely on entirely different or a very limited number of specific host plant species than the adult stages which feed on nectar-rich or pollen-rich plants; these host plants are not generally contained in 'wildflower' mixtures. For instance:

- Butterflies such as Speckled Wood, Meadow Brown, Ringlet, Small Heath and less widespread species such as Gatekeeper and Wall Brown lay their eggs on certain grasses; Small Tortoiseshell on nettle family; Orange Tip mainly on Cuckooflower and Small Blue is confined to Kidney Vetch.
- Some hoverfly larvae feed, for example, by mining certain plants and others feed on invertebrates. Certain species acquire their necessary food in a wet or aquatic environment (for example, wet, decomposing wood). So a diverse, heterogeneous habitat is required for the success of populations of this very diverse group.

Introducing swathes of short-lived 'wildflowers' onto roadsides and so-called waste ground is at best cosmetic and palliative; at worst, it is destructive. It distracts from recognition of the real problems facing our native flora and fauna. The floristic and biogeographical consequences of these actions will not stabilise, restore or enhance our native biodiversity. The introduction of non-local plant species into areas where they have never naturally occurred displaces native species, contaminates the genetic integrity of the species which are truly native to the area and disregards (and often destroys) the pre-existing biogeographical evidence and ecological significance of the site into which the seeds have been sown.

The contents of wildflower seed mixtures are determined by the horticultural trade. Plants are selected for these mixes on the basis of being colourful with high visual human impact — the resulting assemblage of plants would never be found growing together in the wild. They are often labelled as 'native wildflowers', but many of the commonly included species are not, in fact, native to Ireland, least of all to the place where the seed is sown. (All true species are native somewhere on our planet.) These alien species displace the native Irish flora, they have the potential to disrupt faunal populations, and they present floral cues which native pollinating species may not recognise. They may carry pests and diseases and there is a risk of invasive alien species being introduced inadvertently: for example, Black Grass (*Alopecurus myosuroides*) — an invasive alien species of arable fields — was [recently discovered](#) in an imported 'wildflower' mixture at the Teagasc research centre at Oak Park, Co. Carlow.

Planting mixtures of 'native' species is also problematic. The seed is often of non-native provenance (imported from abroad and sometimes grown on) and therefore genetically different to local, indigenous populations of the same species. Risks associated with such introductions are:

- Mal-adapted genotypes could hybridize with and compromise Irish populations, e.g. imported plants could have a different phenology (timing of flowering etc.). Rather than aiding the conservation of rare Irish species, this could undermine locally adapted populations by introducing non-local genotypes.
- Imported genotypes might become invasive in Ireland, as with the European *Phragmites australis* genotype introduced into the USA, which [outcompetes](#) native genetic strains.
- Invasive genotypes could emerge through hybridization with native genetic strains, such as through the introduction of cryptic species from continental populations (perhaps composed of different cytotypes or chromosome numbers). For example, *Achillea millefolium* agg. (Yarrow) represents an aggregate of at least [four different cytotypes in the Iberian Peninsula](#)

The genetic integrity of what remains of our rare and ecologically significant native species is, therefore, threatened by the introduction of seed from external sources. Pollen from these geographical insertions and intrusions cannot be prevented from fertilising the local native stock of the same species or causing hybridisation with other closely related species.

Modern science, at the molecular level, has discovered that differing patterns of genetic lineage of certain species reveal the different routes by which they arrived into different areas. This type of research informs us as to how our island was colonised naturally by the various plant and animal species. Introducing seeds from external sources makes nonsense of the historical and geographical evidence inherent in their uncontrived distribution patterns. Corn Marigold, Corn Cockle and Cornflower — common components of 'wildflower' mixtures — were, as their names suggest, former contaminants of cereal crops. Some, such as Corn Marigold, still persist on base-poor, arable ground. The plant-geographer is increasingly confronted and confounded by the newly introduced, commercial plantings.

More serious, however, is the representation as being native of species which though they might so be in certain areas, are most definitely not of the same genetic stock as those which persist in the hinterland into which they have been seeded. How it will be possible for future environmentalists to differentiate between the two or more sources is not clear. Thus, valuable and irreplaceable biogeographical evidence is being contaminated or lost.

Preparing the ground for sowing seeds requires the removal of pre-existing vegetation (sometimes using toxic sprays) and disturbance to naturally occurring soils which support not just the flora but a wide variety of long-established microbes and invertebrates. We are aware of situations where:

- vegetation was removed from existing roadside verges in order to plant 'wildflowers', without any expert survey of either the plant species present and/or the dependent fauna;
- existing vegetation was removed and 'fresh' soil imported to facilitate the broadcasting of 'wildflower' seed on roadside verges;
- it was proposed to remove existing roadside vegetation in a highly sensitive location — and only through fortunate circumstances were we able to interact with the well-intentioned civic group and persuade them to desist from going ahead with the 'wildflower' planting.

Rather than counteracting biodiversity loss, therefore, the use of 'wildflower' seed mixtures constitutes a further anthropogenic disturbance to what remains of the natural world. It is a tokenistic horticultural response intended to mitigate and ameliorate past and present habitat loss by introducing a pastiche of irrelevant species to places in which they do not naturally occur. This activity is effectively a diversionary action which deflects attention from the real issues.

The Way Forward

Rather than attempting to forge nature's signature by the introduction of seed mixes in fruitless endeavours to create new habitat or to "improve" existing habitat, there is scope for the stimulation of dormant or suppressed seed banks by appropriate management of both small and larger areas where biodiversity has not been totally sterilised by either maltreatment or abandonment. More benign management of grasslands in both public and private ownership, including lawns, parks, roadsides and motorway verges by, for example, the introduction of appropriate mowing regimes, will help to rescue fragments of our indigenous flora and fauna. In some instances, the 'turning over' of soil will be quite productive. Similarly, pockets of farmland and open countryside which have not been devastated by over-intensive management (including "reseeding"), will have areas which have the potential of at least a partial restoration of their former biodiversity.

The indigenous flora of Ireland is under considerable pressure and is losing out. If we wish to retain what we still have, the causes of the decline need to be understood and addressed urgently. Nature, by definition, is not something we can create, nor should we try. Instead, by managing the landscape less intensively and by leaving some areas untouched, native species can maintain their populations on site. This is rewilding, in the true sense, and it requires no additional resources. The resulting species combinations thus become the sustainable, enduring and authentic botanical expression of the local habitat types.

If people wish to attract insects to their suburban and urban gardens, a supply of flowering trees, shrubs and long-flowering herbaceous perennials will provide a diverse cocktail of food sources for the insects that find this menu congenial. However, generic interventions will not restore the ecological support system upon which the rarer plants, insects and other invertebrates depend.

Some colonising species are spreading without contrivance as they have the ability to track the movements of humankind, from the Neolithic era to the Anthropocene, spreading or being spread as environments alter or are altered. Many of our native species are now in serious decline, unable to withstand land-use changes brought about by agricultural intensification and drainage, farm price-support mechanisms and land abandonment. 'Wildflower' mixtures engender visions of a fantasy world which bears little resemblance to the natural one. Their deployment disguises the real character and consequences of landscape change by misrepresenting the indigenous expression of the character of the flora of an area and supplanting it with whatever the commercial sector provides.

In conclusion, we are of the view that the distribution of 'wildflower' seed mixtures will not enhance Ireland's natural biodiversity, it is damaging to what remains and it will divert attention and funding from addressing the underlying causes of the ongoing destruction of our flora and fauna.

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References & further reading

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Figures



Fig. 1. The grassy area in the foreground contains Cuckooflower, *Cardamine pratensis*, a native species of damp grassland in Dublin and a major food plant of Orange Tip butterfly larvae. The conspicuous purple and white flowers further along the bank are the related, non-native Dame's-violet, *Hesperis matronalis*, apparently recently sown and displacing Cuckooflower. Growing amongst the Dame's-violet are the non-natives Honesty, *Lunaria annua*, Flax, *Linum usitatissimum*, and Californian Poppy, *Eschscholzia californica*. St Mobhi Drive, June 2021.



Fig. 2. A pastiche of predominantly non-native annual species — an impossible assemblage in nature — growing along roadsides in Portrane, Co. Dublin (July 2020). This mixture was inserted into the traditional territory of Prickly Poppy, *Papaver argemone*, a rare species of sandy fallow ground near the sea, now in serious decline due to suburban encroachment.



Fig. 3. Mass plantings of eye-catching, fast-growing, quick-flowering plants (Yarrow, Campion, Poppy, Oxeye Daisy, etc.) at Trinity College Dublin, June 2021. This grouping misrepresents the species assemblages that would occur in nature and does not meet the complex habitat requirements of threatened insects.



Fig. 4. A visually appealing species assemblage of unknown provenance, sown in a flowerbed in Phoenix Park, mimicking plant communities of dry, nutrient-poor, lime-rich soils of the midlands (June 2021). Importing non-local genetic strains and placing them in proximity to natural populations of the same species risks contaminating the genetic integrity of the established populations and it distorts biogeographic patterns.



Fig. 5. Clare Island (above) was selected by the Royal Irish Academy as the site for a seminal study of flora and fauna, on account of its almost uncontaminated condition, in the early 1900s, and a series of studies was conducted by distinguished national and international experts, led by Robert Lloyd Praeger. Sowings of exotic species (above, photographed in 2010) have not enhanced its natural attributes.