

Biodiversity Action Plan 2023-2027 For Ballinderry, Co. Tipperary

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On behalf of Ballinderry Development Association

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 **The Community
Foundation for Ireland**

Contents

1. Acknowledgements.....	4
2. Introduction	5
What is Biodiversity?	5
Current trends in Biodiversity	5
Spotlight on Pollinators.....	6
Threats to Pollinators.....	6
All Ireland Pollinator Plan	7
How this plan was produced.....	8
Ballinderry Development Association.....	8
Recent progress in Biodiversity.....	9
What will this Biodiversity Action Plan Contain?.....	10
3. Local Setting.....	11
Habitats in Ballinderry.....	13
Aquatic Habitats.....	15
Hedgerows	17
4. Actions for Biodiversity	19
Mapping Biodiversity Actions	21
Appendix 1: Wildlife Friendly Planting and management	23
Appendix 2: Hedgerow Management.....	26
Appendix 3: Bird Boxes	30
Appendix 4: Creating habitat for Solitary Bees.....	31
Appendix 5: Species Recorded in Ballinderry	32
Appendix 6: Hedgerow Assessment Table	
Appendix 6: Online Resources	36
Figure 1: Endangered Pearl-Bordered Fritillary	7
Figure 2: Endangered Tawny Mining bee (Pollinators Ireland, 2023)	7
Figure 3: Current biodiversity measures in Ballinderry	9
Figure 4: Mature treeline & stonewalls in Ballinderry.....	12
Figure 5: Dipper nest (photo by Helen Fox).....	12
Figure 6: White-tailed bumblebee on Poppy at Riverside walk Ballinderry	13
Figure 7: Habitat Map Ballinderry.....	14

Figure 8: Q-Values (EPA, 2013)	16
Figure 9: Ballyfinboy River	16
Figure 10: Abundance of blackberries on hedgerow in Ballinderry	17
Figure 11; Honeysuckle on hedgerow along Borrisokane Rd	18
Figure 12: Aerial view of proposed locations for actions	21

Table 1: Habitats and local biodiversity value	15
Table 2: Actions for biodiversity enhancement	19
Table 3: Actions for biodiversity awareness and education	20
Table 4: Actions for Citizen Science and recording.....	20
Table 5: Annual review of plan	21

1. Acknowledgements

This Biodiversity Action Plan was funded by the Community Foundation of Ireland under the 'Biodiversity in Focus' initiative. Under this biodiversity initiative communities were encouraged to combine the expertise of their ecologist with their own local knowledge to create a Biodiversity Action Plan.

Sincere thanks to all members of the Ballinderry Development Association for their time and input towards the development of this plan, we hope that it will enhance biodiversity within our community for many years to come.

"Biodiversity starts in the distant past and point towards the future" – Frans Lanting

2. Introduction

What is Biodiversity?

Biodiversity or Biological diversity is variability of all living things on earth from and includes.

- Genetic diversity (genes)
- Specific diversity (Species)
- Ecological diversity (ecosystems)

Biodiversity as we experience it today, has taken 4.5 million years of evolution to form the intricate web of life. Biodiversity also provides us with essential ecosystem services including food, water purification, climate regulation, soil formation, pollination of crops, disease control, pest control, fuel and recreation (health and wellbeing), medicine. It is estimated that global value of the services provided by biodiversity is \$140 trillion per year with the value of ecosystem services in Ireland €2.6 billion annually.

Current trends in Biodiversity

It current times it has become increasingly apparent that biodiversity has declined at an alarming rate. According to the World Wildlife Federation (WWF) Living Planet Report 2022, wildlife population have declined by an average of 69% since 1970.

The main threats to biodiversity are

- Changes in land and sea use
- Species overexploitation
- Invasive species and diseases
- Pollution
- Climate change.

Having outlined the threats to Biodiversity it is apparent that they can be largely attributed to human activities. In light of the essential services which biodiversity provides, it is increasing important that we all play our part, however small, to protect and restore biodiversity.

Spotlight on Pollinators

A pollinator is any species (bees, wasps, butterflies, moths, flies, bats) that facilitates the transfer of pollen from the male parts of a flower (stamen) to the female part of the flower. While some plants are pollinated by wind, approximately 88% of all flowering plants are dependent on pollinators for fertilisation and completion of its life-cycle via the production of fruits and seeds.

Economically it is estimated that pollination services within the European Union are worth €15 billion annually. Within Ireland alone, the value of these services account for approximately €59 million annually. Approximately one third of all the foods we consume exist as a product of pollination. It is important to remember, however, that pollination not only results in food for human consumption but also provides food and maintains habitat structure for a wide range of wildlife.

A sobering fact is that 40% of all insect species globally are under now diminishing. Research has shown that since the 1980's Ireland's native bees have undergone a rapid decline with 30% of species considered to be at risk of extinction in Ireland, similarly, 18% of our butterflies are currently under threat of extinction. (Irish Pollinator Plan, 2021).

Threats to Pollinators

- **Habitat Loss** - Land use change for human development, intensification of agriculture and forestry have led to loss of wildflower habitats (hay meadows).
- **Pesticides & Herbicides** – Some pesticides may affect non-target species, herbicides which are applied to plants can contaminate pollen grains and kill food plants of pollinators.
- **Climate change** - Temperature and timings are critical to the life-cycle of insects. As the climate warms a mismatch in the emergence of the larvae and their foodplants can occur.
- **Pest and disease** - Parasites and diseases such as *Varroa* mite, hive beetle, hornet and colony collapse disorder can have a significant effect on the honeybee.



Figure 1: Endangered Pearl-Bordered Fritillary



Figure 2: Endangered Tawny Mining bee (Pollinators Ireland, 2023)

All Ireland Pollinator Plan

Ireland's first national pollinator plan was published in 2015, at this time it had become worryingly apparent that many of our pollinator species had significantly declined. The main focus of the first All-Ireland Pollinator plan was to

- Identify actions to the area and quality of flower-rich habitats.

- Create pollinator highways along our motorways.
- Support pollinators within farms, businesses, public land and gardens
- Advocate for pollinators

To date 55% of County Councils and 270 businesses have become partners to the All-Ireland Pollinator Plan with 81 actions implemented to restore and create pollinator habitat throughout Ireland. The second All – Ireland Biodiversity Action Plan published in 2021 has set even more ambitious targets for Pollinators containing some 186 actions based around six main objectives:

- Making farmland pollinator friendly
- Making private land more pollinator friendly
- All Ireland Honeybee Strategy
- Conserving rare pollinators
- Strategic coordination of the plan

How this plan was produced

In Autumn of 2021, The Ballinderry Development Association (BDA) applied for funding under the Community Foundation Ireland Biodiversity programme. Having been successfully granted funding in January 2022 the BDA began consultation with the ecologist. Initial meetings with the group took place in May 2022. A desk top review of Ballinderry and its surroundings was undertaken in May of 2022 and four field visits were conducted between May 2022 and September 2022 also. A final meeting with the group was held in November 2022 where potential objectives and future actions for biodiversity were discussed and agreed upon.

Ballinderry Development Association

The Ballinderry Development Association (BDA) was initially established to promote Ballinderry and its surroundings, acting as a body to engage with National, County, and local agencies as required. The principal aims of the BDA is to promote and protect Ballinderry and an area of

- Tourism,
- Heritage,
- Biodiversity and community development.

Recent progress in Biodiversity

In recent years, the Ballinderry Development Association has actively facilitated a number of actions to enhance biodiversity within in village, there has also been a focus on moving towards biodiversity friendly gardening and vegetation management. A full list of actions can be seen below.

- Developed a 1.5km riverside walk by the Ballyfinboy river.
- Planted approx. 300 bare root native trees.
- Planted wildflower seed and bulbs throughout the village.
- Encouraged reduced mowing of roadside verges and private gardens.
- Encouraged the panting of pollinator friendly flowers in flowerbeds and planters within the village.
- Worked on biodiversity awareness with the local school.
- Moved to only using peat free compost in village planters.



Figure 3: Current biodiversity measures in Ballinderry

What will this Biodiversity Action Plan Contain?

- Synopsis of biodiversity highlights
- Habitat mapping
- A number of objectives/goals for the enhancement of biodiversity in Ballinderry
- A list of online resources

3. Local Setting

Ballinderry is a small, picturesque village in Co. Tipperary, which is located just 24km North of Nenagh. The village is located less than 2km from the shores of Lough Derg. Although being a popular tourist spot due to its proximity to the lake, Ballinderry has retained its quaint, rural beauty.

Oak trees were very prominent in the village up until the turn of the 19th century, hence its name, Baile an Doire. Today there's just one mature Oak tree within the village boundary. This is aged at approximately 175yrs old. Due to presence of the Drominagh Estate in Ballinderry since the 1800's there is a long history of woodlands and tree planting, this is apparent in the veteran trees which line the village and expansive private woodlands which occur outside the village. Ballinderry Watermill and former distillery which was built in the early 1800's represents the former industrial history of Ballinderry village and wider environs.

In looking at aerial imagery of Ballinderry it can be seen that agriculture is the dominant land use within the surrounding environment. Linear features such as treelines and hedgerows play a vital role in connecting the village with the agricultural environment and provide food, refuge, and travel networks for local wildlife. This rich landscape is home to many species of animals and birds and the reintroduction of the White- Tailed- Sea Eagle saw the successful birth of the first Irish born chicks to and Irish born parent on nearby Lough Derg in 2019. The first in over 200 years.

Another important feature within Ballinderry is the Ballyfinboy river. The Ballyfinboy river rises in Co. Offaly and flows through Ballinderry before entering Lough Derg just 1.7km downstream of Ballinderry village. Lough Derg is a Special Protected Area (SPA), which is a European protected site due to the presence of Cormorant, Tufted Duck, Goldeneye, Common Tern and Wetland habitats. This rich landscape is home to many species of animals and birds and the reintroduction of the White- Tailed- Sea Eagle saw the successful birth of the first Irish born chicks to and Irish born parent on nearby Lough Derg in 2019. The first in over 200 years.



Figure 4: Mature treeline & stonewalls in Ballinderry



Figure 5: Dipper nest (photo by Helen Fox)



Figure 6: White-tailed bumblebee on Poppy at Riverside walk Ballinderry

Habitats in Ballinderry

Fieldwork to determine the habitats present within Ballinderry was carried out during the summer of 2022. Habitats were mapped according to Fossitt (2000) and can be seen in Figure 4. Furthermore, Table 1 outlines the habitat types along with their local biodiversity importance.



Figure 7: Habitat Map Ballinderry

Table 1: Habitats and local biodiversity value

Fossitt Code	Habitat Type	Local Biodiversity Value
GA1	Improved Grassland	Low
FW2	River	High
WL1 & WL2	Hedgerow & Treelines	High
BL1	Stone walls and other stonework	Medium
GS2	Dry meadows and grassy verges	Medium
BC1	Arable crops	Low
BL3	Buildings and artificial surfaces (including gardens)	Medium
WD	Woodland	High

Aquatic Habitats

As mentioned previously the Ballyfinboy is an important ecological corridor as it connects the village of Ballinderry with Lough Derg SPA. The Environmental Protection Agency (EPA) Q-Values which samples macroinvertebrates (aquatic insects) to assess the biological conditions of rivers throughout. Different macroinvertebrates have distinct tolerance levels to pollution and therefore can be used to determine the condition of our rivers. The most recent EPA Q-Values records for the Ballyfinboy River in Ballinderry shows that the Q-Value is 3-4 or moderate status. Figure 5. Provides an overview of the Q-Value system relative to pollution. Given that agriculture is the dominant land use surrounding Ballinderry the Q-Value is as expected for the area. In addition to the moderate Q-Values the Ballyfinboy River is also categorised as being 'At Risk' of not meeting its Water Framework Directive (WFD) objectives by 2027 (Catchments, 2023).

EPA RIVER QUALITY SURVEYS: BIOLOGICAL

Biotic indices ("Q Values") reflect average water quality at any location as follows:

Q Value*	WFD Status	Pollution Status	Condition **
Q5, Q4-5	High	Unpolluted	Satisfactory
Q4	Good	Unpolluted	Satisfactory
Q3-4	Moderate	Slightly polluted	Unsatisfactory
Q3, Q2-3	Poor	Moderately polluted	Unsatisfactory
Q2, Q1-2,	Bad	Seriously polluted	Unsatisfactory

Figure 8: Q-Values (EPA, 2013)



Figure 9: Ballyfinboy River

Hedgerows

The hedgerows in Ballinderry also act as an extremely important ecological corridor by connecting the village with the wider agricultural environment. Hedgerows provide vital habitat for many mammals, birds and insects and allow for the movement of plants and animals across the landscape. Hedgerows also provide many valuable ecosystem services such as maintaining soil and water quality, and removal of carbon from the atmosphere.

The hedgerows in Ballinderry which run along the Borrisokane Road were surveyed and assessed according to Foulkes *et al* (2013). Overall, the condition of the hedgerows sampled was found to be *adequate to favourable*. Blackthorn and Whitethorn are the dominant shrub species with abundant Bramble occurring throughout. Elder is also present and occurs frequently. The dominant tree species is Ash; however, it was noted at the time of survey that many of the Ash trees are showing signs of ash dieback. In places the hedgerows have been cut back to less than 1.5m and therefore are unsuitable for nesting birds and provide significantly less resources for foraging pollinators and birds.

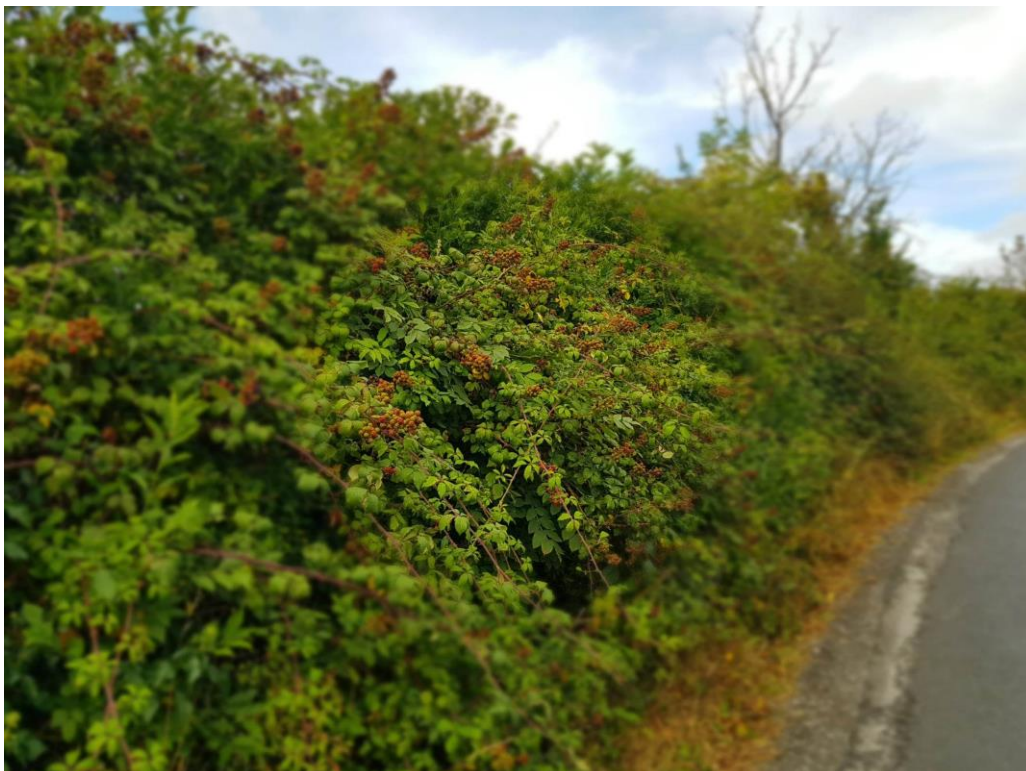


Figure 10: Abundance of blackberries on hedgerow in Ballinderry



Figure 11; Honeysuckle on hedgerow along Borrisokane Rd

4. Actions for Biodiversity

The following actions have been proposed as part of this Biodiversity Action Plan, the objectives are designed to be achievable within five (2023-2027) and with the resources which are available to the Ballinderry Development Association. It is envisaged, however, that the majority of actions within the plan will continue long after this initial five-year timeframe.

Table 2: Actions for biodiversity enhancement

Action: Biodiversity Enhancement	Code	Location	Timeframe
Conduct further planting of native trees and shrubs	B1	Community woodland area (Previously planted by BDA) & other suitable locations	Year 1-5
Erect bird boxes	B2	Mature trees throughout the village & private gardens where possible. Install dipper box under the bridge	Year 2
Use pollinator friendly flowers in flowerbeds and pots	B3	Throughout the village	Year 1-5
Create wildflower patches (Use seed produced in Ireland)	B4	Old ESB building, available green space (even small)	Year 1-5
Use biodiversity friendly hedgerow management practices	B5	Everywhere possible throughout the village	Year 1-5 & ongoing
Explore the potential to plant native hedges	B6	GAA grounds	Year 2-3
Future proof hedgerows (replace Ash with alternative native species)	B7	In areas impacted by Ash dieback	Year 1-5
Use natural methods of weed control	B8	Throughout the village and private gardens	Year 1-5 & ongoing
Do not clear ivy from stone walls or trees.	B9	Throughout the village	Year 1-5 & ongoing
Create habitat for solitary bees	B10	Suitable banks (Old ESB building)	Year 1-2

Table 3: Actions for biodiversity awareness and education

Action: Education & awareness	Code	Location	Timeframe
Develop interpretive signage to highlight local biodiversity	E1	Riverside walk	Year 2-3
Network with the local schools including Kyle regarding biodiversity awareness & education (working towards Green Flag)	E2	Kyle National School	Year 1-5
Hold a Biodiversity Day	E3	Ballinderry Village	Year 1-2
Link up with other biodiversity/conservation groups within North Tipperary	E4	Online, local events	Year 1-5
Organise a biodiversity awareness event on Birds in the area (Birds of Prey)	E5	Any suitable venue in Ballinderry	Year 1-2

Table 4: Actions for Citizen Science and recording

Action: Citizen Science	Code	Location	Timeframe
Establish a butterfly transect with Ballinderry	C1	Riverside walk	Year 1 and ongoing thereafter
Establish a bumblebee transect within Ballinderry	C2	Riverside walk	Year 1 and ongoing thereafter
Upload future biodiversity records to NBDC website	C3	Online	Year 1-5 & ongoing thereafter
Encourage community to take part in the annual Garden Birds Survey (Birdwatch Ireland)	C4	Private gardens	2-5
Monitor Dipper boxes	C5	Bridge	2-5
Record events which may help track climate change (appearance of snowdrops, daffodils, tree buds, first swallow)	C6	Throughout the village and private gardens	Year 1-5 & Ongoing thereafter

Monitor and report the establishment of invasive species	C6	Within Ballinderry and surrounds	Ongoing
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Table 5: Annual review of plan

Action: Review	Timeframe
BDA to carry out an annual review of the actions taken with regard to the Biodiversity Action Plan	Year 2-5

Mapping Biodiversity Actions

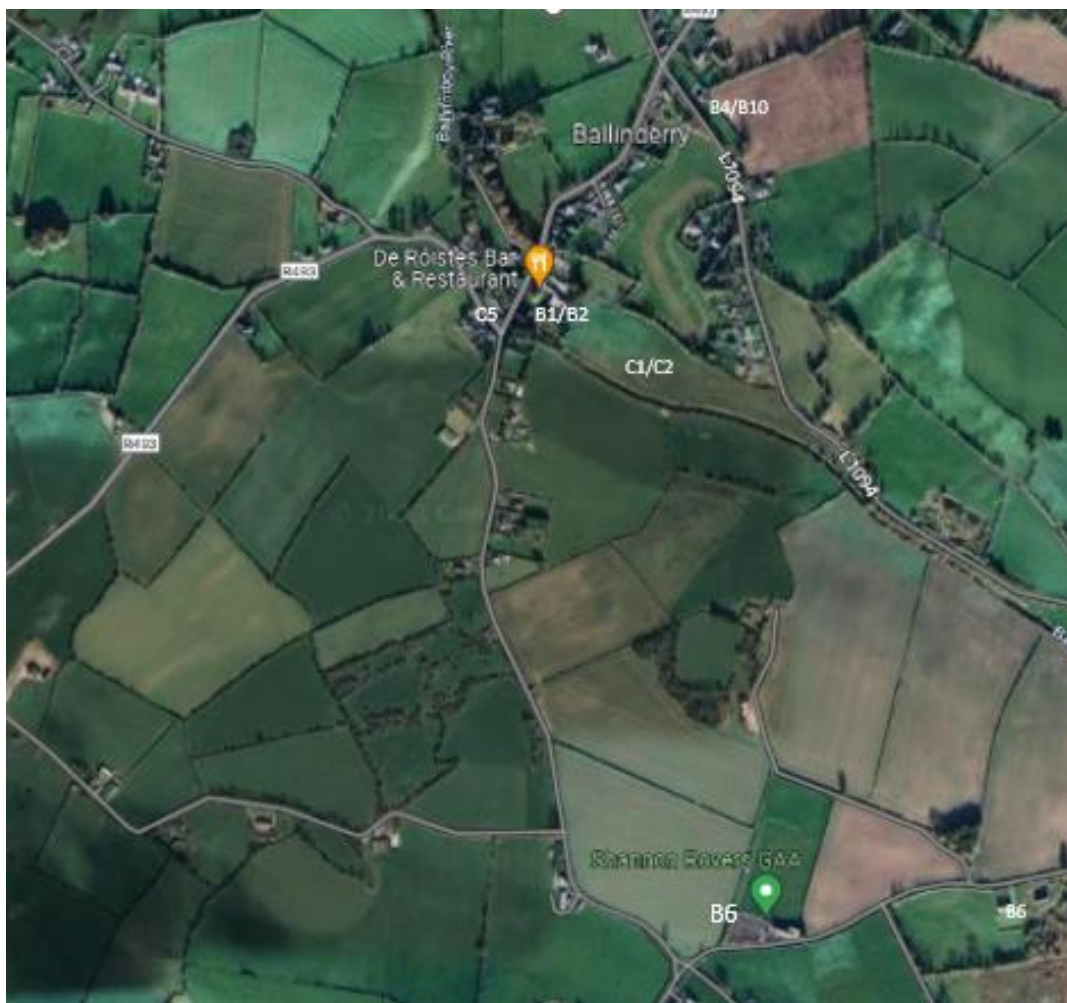


Figure 12: Aerial view of proposed locations for actions

Appendix 1: Wildlife Friendly Planting and management

Herbaceous species

- Allium
- Bellflower
- Bluebells (native)
- Borage
- Canterbury bells
- Catmint
- Comfrey
- Cornflower
- Cosmos
- Cowslip
- Crocus
- Echinacea
- Evening primrose
- Fleabane
- Forget-me-not
- Foxglove
- Globe thistle
- Hebe
- Lambs ear
- Lavender
- Love-in-a-mist
- Poached egg flower.
- Poppy
- Primrose (native)
- Red valerian
- Rosemary
- Snapdragon
- Snowdrops
- Sunflower
- Sweet alyssum
- Sweet William
- Teasel
- Verbena
- Wallflower
- Yarrow

Shrubs

- Bell heather
- Berberis
- Broom
- Dog rose.
- Dogwood
- Elder
- Fruiting shrubs (Raspberry, Blackcurrant)
- Guelder rose.
- Hawthorn
- Honeysuckle
- Spindle
- St John's Wort

Management of Grass Verges

- Try to delay mowing until dandelion has stopped flower, this is an important early food source for bees.
- Reduce the overall mowing regime to give wildflowers time to go to flower and go to seed.
- Grass cuttings can be left for a few days to allow seed to disperse but should be removed thereafter.
- Refrain from using herbicides.

Pollinator-friendly grass cutting

Reducing your grass cutting regime is the most cost-effective way to help bees – these actions do not involve purchasing wildflower seed



Short-flowering meadow:

Cut parts or all of your grass less frequently to allow wildflowers to grow and provide food.

Long-flowering meadow: provides food and shelter for pollinators

Kept short for humans

Short-flowering meadow: provides food for pollinators

These flowers will naturally grow in slightly longer grass. The more of these flowers the better!



This image shows a mosaic of three different grass cutting regimes.

Appendix 2: Hedgerow Management

(Adapted from The Wildlife Trusts <https://www.wildlifetrusts.org/wildlife/managing-land-wildlife/how-manage-hedgerow-wildlife>)

- No hedgerow management during the bird nesting season March-August
- Any required trimming should be carried out in January or February as hedgerow berries provide a valuable food source for birds during the winter season
- Hedges should not be cut annually as buds usually form on second year growth
- Hedges should be trimmed on a three-year rotation with different sections being cut each year. This will ensure that there are always flowers for pollinators in spring and berries for birds in winter
- Hedges cut on this three-year rotation produce 2.5 times more flowers and berries than hedges which are cut annually.
- Hedges should be cut to an A shape – wider at the bottom than the top
- Remember hedges must be a minimum of 1.5 metres to provide nesting habitat, over 2 metres is optimal
- Create a buffer strip of 2 metres by the hedge, the grass here should be uncut. This provides ideal foraging, nesting and overwintering habitat for insects, birds and small mammals
- The base of the hedgerow can support many native plants, no herbicide, pesticide or fungicide should be used within 2m of a hedgerow base
- If filling in gaps in a hedge, introduce new native species. For example, if you have a blackthorn hedge add some elder or hawthorn

Suitable Hedgerow Species

- Hawthorn
- Blackthorn
- Elder
- Hazel
- Birch
- Guelder rose
- Wild Cherry
- Crab apple
- Rowan

Planting a Native Hedgerow

- Plant bareroot trees at 3 plants per metre
- To create a dense hedge plant the trees in two staggered rows at 5 plants per metre
- Blackthorn, Hawthorn, Hazel and Guelder rose should be sown in the back row, with trees to the front
- To create a more natural effect, plant trees randomly rather than in defined spaces
- Do not prune in the first two years.

Native Biodiversity-friendly Trees



All native tree planting is a climate action, and will benefit biodiversity, as well as human health and wellbeing.

Those trees that are specifically good for pollinators are highlighted with the bee icon.

Hawthorn/ Whitethorn



Hawthorn/ Whitethorn is also called the 'Maybush' because of its beautiful display of blossoms each May. It is a common hedgerow species, but can also be grown as a standalone tree - a very wildlife-friendly option, producing lots of flowers for pollinators and red haws in autumn for birds

to enjoy. Hawthorn supports c.149 insect species.

Blackthorn



Blackthorn provides a home for 109 insect species. Related to cherries and plums, the fruit of the blackthorn resemble small plums and are enjoyed by lots of animals, including wood mice, finches and foxes.

Oak



Oak is Ireland's national tree and its ability to sustain biodiversity makes it hugely important to our wildlife. Oak supports 284 different insect species, 324 lichens, and can live for 1,000 years. While Oak is a large tree

when fully grown - growing up to 40m in height - perhaps there is room in a club with large grounds for such an important tree.

Willow



Willow supports 266 insect species and 160 lichens. Goat or Grey willows are wonderful plants for pollinators as they provide lots of pollen and nectar in their tiny flowers in early spring when there is little else in flower. Willows can be

grown easily from cuttings.



Ash



Ash is a common native Irish tree, which supports 41 native insects and 255 lichens. The wood from ash trees has been used to make hurleys for thousands of years.

Rowan



Rowan is also known as 'Mountain Ash' as it has similar leaves to the ash tree. Rowan supports 28 insects and 125 lichens. It is a very attractive tree, with white flower clusters in spring for pollinators, and red berries in autumn.

Birch



Birch can be recognised by its silver-white peeling bark. Birch supports 229 insect species and 126 lichens. In spring, its growth of seed-rich yellow-brown catkins attracts birds.

Hazel



Hazel is a small native tree or shrub that produces edible hazelnuts in autumn for mammals and birds. Hazel also supports 73 insect species and 160 lichens.

Wild Cherry



Wild Cherry is a pretty native tree that will provide food for pollinators as well as fruit for birds.

Crab Apple



Crab Apple can be found in many of our old native hedgerows. It supports 93 insect species, including pollinators, and crab apples provide food for birds and mammals in autumn.

*Insect & lichen diversity based on UK Research and refers to Britain. It is included here to demonstrate how important different native trees are to biodiversity. Ref. Southwood, T.R.E (1961) The number of species of insect associated with various trees. *J. Animal Ecology* 30:1-8. Rose F. and Harding, P.T. (1978) Pasture and woodlands in Lowland Britain and their importance for the conservation of the epiphytes and invertebrates associated with old trees. Nature Conservancy Council & The Institute of Terrestrial Ecology.

Appendix 3: Bird Boxes

(Adapted from Ireland's Wildlife, <https://irelandswildlife.com/nestboxes/>)

- ❖ There is a wide range of nest boxes available for specific bird species. However, in general, nest boxes can be divided into two categories.
 - (a) Open fronted nest boxes
 - (b) Nest boxes with an entrance hole
- ❖ Many Irish bird species will use a nest box with an entrance hole, the size of the hole should be suited to the species you want to attract
 - **A 25mm entrance hole** will suit smaller species like Coal Tits and Blue Tits
 - **A 28mm entrance hole** will work for the larger Great Tit
 - **A 32mm entrance hole** will accommodate the slightly chunkier House Sparrow
 - **A 45mm entrance hole** will attract larger hole-nesters like Starlings.
- ❖ Open fronted bird boxes are suitable for birds which nest in hedgerows such as Robin, Wren, and Wagtail
- ❖ If building a nest box ensure that the material you use is suitable for the purpose. The material should keep chicks warm in spring and cool in summer – for this reason wood is the best material for bird boxes
- ❖ If you choose to paint the nest box use paint which is non -toxic. Do not use bright colours as the nest box should blend into the surrounding environment.
- ❖ Attach the bird box to a suitable tree, hole nesting species prefer a higher placement of the box approx. 2-3 metres high. For birds which use open fronted nest boxes such as Robins and Wren the box should be placed 1-1.5 meters high. These should have dense cover to protect the birds from predators.
- ❖ Orientate the nest box so that it is facing roughly north-east, this will give protection from the prevailing winds and sun.

Appendix 4: Creating habitat for Solitary Bees

How to provide suitable habitat for ground-nesting solitary bees on farmland

Our 64 species of mining solitary bees nest by making tiny burrows in bare earth clay, peat, sand and soil. They will nest in flat well-drained areas but will generally prefer south/west facing sheltered banks.

YOU WILL NEED:

- 1 A well-drained sunny south or west facing bank (or an aspect in between). Alternatively, you can use well drained flat ground.
- 2 A spade.
- 3 Some muscle.

Making a bare soil nest site is as easy as one, two, three.

- 1 Ensure flowers are close by.
- 2 Clear the vegetation on your bank with a spade. Vegetation will need to be kept clear and the site may need to be cleared more than once a year.
- 3 Avoid clearing back the vegetation when the nest is active. Never spray the site with pesticides or allow drift to access the site.



Figure 1 Active mining bee nest at the base of a hedgerow.

These sites can be created along hedgerows, driveways, and other field boundaries. Bees don't like the damp so be sure the sites are dry banks. The evidence from the EIP suggests that hedgerows are the location most likely to be used. Scraping back the top layer of vegetation will not disturb the bees when they are not active.



National Biodiversity Data Centre (2019)

Appendix 5: Species Recorded in Ballinderry

- Annual meadow grass (*Poa annua*)
- Ash (*Fraxinus excelsior*)
- Beech (*Fagus Spp.*)
- Birch (*Betula pendula*)
- Blackthorn (*Prunus spinosa*)
- Bracken (*Pteridium aquilinum*)
- Chestnut (*Castanea sativa*)
- Cocks foot (*Dactylis glomerata*)
- Common alder (*alnus glutinosa*)
- Common dog rose (*Rosa canina*)
- Common ivy (*Hedera helix*)
- Common lime (*Tilia X europea*)
- Common nettle (*Urtica dioica*)
- Common poppy (*Papaver rhoeas*)
- Common ragwort (*Jacobaea vulgaris*)
- Common reed (*Phragmites australis*)
- Creeping bent (*Argrostis stolonifera*)
- Creeping buttercup (*Ranunculus repens*)
- Crested dogs tail (*Cynosurus cristatus*)
- Daisy (*Bellis perennis*)
- Dandelion (*Taraxacum vulgaria*)
- Elder (*Smbucus nigra*)
- False oat (*Arrhenatherum elatius*)
- Field speedwell (*Veronica persica*)
- Foxglove (*Digitalis purpurea*)
- Fuchsia (*Fuchsia magellanica*)
- Great willowherb (*Epilobium hirsutum*)
- Grey willow (*Salix cinerea*)
- Groundsel (*Seneico vulgaris*)
- Harts tongue fern (*Asplenium scolopendrium*)
- Hawthorn (*Crataegus monogyna*)
- Hazel (*Corylus avellana*)
- Herb Robert (*Geranium robertianum*)
- Honeysuckle (*Lonicera periclymenum*)
- Knapweed (*Centuarea nigra*)
- Meadowsweet (*Filipendula ulmaria*)
- Oxeye Daisy (*Leucanthemum vulgare*)
- Perennial rye grass (*Lolium perenne*).
- Perennial Sowthistle (*Sonchus arvensis*)
- Pineapple weed (*Matricaria discoidea*)

- Red valerian (*Centranthus ruber*)
- Rosebay willowherb (*Chamaenerion angustifolium*)
- Rowan (*Sorbus accuparia*)
- Scarlet pimpernel (*Anagallis arvensis*)
- Self-heal (*Prunella vulgaris*)
- Sessile Oak (*Quercus petraea*)
- Silverweed (*Potentilla anserina*)
- Slender St John's Wort (*Hypericum pulchrum*)
- Spear thistle (*Cirsium vulgare*)
- Spindle (*Euonymus europaeus*)
- Wall rue (*Asplenium ruta-muraria*)
- Water forget-me-not (*Myosotis scorpioides*)
- Wild angelica (*Angelica sylvestris*)
- Yorkshire Fog (*Holcus lanatus*)

Appendix 6: Hedgerow Assessment Table

Structural Variables	0	1	2	3
Dimensions	Unfavourable	Adequate	Favourable	Highly Favourable
Height	≤1.5	1.5 - 2.5m	2.5 – 4m	≥4m
Width	≤1m	1-2m	2-3m	≥3m
Profile	Remnant, Derelict	Wind-shaped, losing bases structure	Boxed, A-Shaped, Straight Sided	Overgrown, Top heavy
Basal Density	Open	Semi-translucent	Semi-Opaque	Dense
Continuity	0	1	2	3
	Unfavourable	Adequate	Favourable	Highly Favourable
% Gaps	≥10%	5-10%	≤5%	Continuous
Specific Gaps	Individual gap ≥5	Individual gap ≤ 5	No gaps	No gaps

Negative Indicators	0	1	2	3
	Unfavourable	Adequate	Favourable	Highly Favourable
Bank/Wall	≥20% length of hedge degraded	≤20% of length of hedge degraded	Minor degradation	No degradation
% Canopy dominated by Ivy	≥25%			
Unfavourable species composition	≥10% Comprised of unfavourable species			
Ground flora hedge base (Y)	≥20% of ground layers showing evidence of herbicide use			
Ground flora hedge base (Y)	Contains noxious weeds ≥20% dominated by Nutrient rich species			
Ground flora/Hedge base (Y)	Presence of Invasive Species			

Degraded Margin	Ploughing up to base of hedge		Grassy margin 2m or greater on one side	Grassy margin 2m or greater on both sides
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Appendix 6: Online Resources

- All Ireland Pollinator Plan <https://pollinators.ie/>
- An Taisce: www.antaisce.ie
- Bat Conservation Ireland: www.batconservationireland.org
- Butterfly Conservation Ireland <http://butterflyconservation.ie/wp/>
- Birdwatch Ireland: www.birdwatchireland.ie
- Catchments: <https://www.catchments.ie/>
- Crann: www.crann.ie
- Design by nature <http://www.wildflowers.ie/>
- Environmental Protection Agency <https://www.epa.ie/>
- Hedgerows Ireland <https://hedgerowsireland.org/>
- Heritage Council: www.heritagecouncil.ie
- Invasive Species Ireland <https://invasives.ie/>
- Irish Moths and Dragonflies www.irishmoths.net
- Irish Seed Savers: www.irishseedsavers.ie
- <http://www.iwt.ie/>
- National Biodiversity Data Centre: www.biodiversityireland.ie
- The Ordnance Survey of Ireland: www.osi.ie/mapviewer
- Vincent Wildlife Trust <https://www.vincentwildlife.ie/>
- Wildflowers of Ireland <http://www.wildflowersofireland.net/>