

KEADUE TIDY TOWNS BIODIVERSITY ACTION PLAN 2019-2023



ACTIONS FOR BIODIVERSITY IN KEADUE



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KEADUE COMMUNITY BIODIVERSITY PLAN

This plan has been compiled to guide the work of Keadue Tidy Towns for the next 3 years. The plan was drawn up following consultation with members of the Tidy Towns group through a number of workshops and meetings held during the summer of 2019.

The plan does not set out to include all of the excellent work carried out by Keadue Tidy Towns Group but rather, to provide direction for the group over the next number of years. The first section of the plan is a general introduction to this Roscommon LEADER Partnership funded project and some general biodiversity basics. Next, an outline of some of the identified **Key Biodiversity Projects** is provided. Finally, there is a schedule of projects that we suggest that the group would undertake over the next three years, the timeframe of this plan.

ABOUT KEADUE TIDY TOWNS

Keadue has entered the *Tidy Towns* competition for the last 43 years and is made up of twenty volunteers. Involvement in the competition has engendered and fostered a great community spirit and interaction between people of all generations and ages in the village. The *Tidy Towns* competition has provided a focal point for village projects and improvements. It facilitates contributions and input from the entire community in a myriad of ways, and engagement with the competition brings about a common and shared identity in the community.

In their 43 years of involvement in the competition, Keadue has won the National *Tidy Towns* award in 1993 and in 2003, along with 9 Gold Medals and

7 Silver Medals and many other awards since first entering the competition. Keadue has won the overall award in the 2004 'All-Ireland Best Kept Town Competition' and the 'Best Kept Village' in the 2015 'All-Ireland Best Kept Town Competition'. Keadue also merited a silver medal in the '*Entente Florale Competition*' in 2003. Keadue *Tidy Towns* Committee has been selected to participate in the '*Entente Florale Competition*' in 2020.

In 2018, in the Roscommon County Council Environmental Awards, Keadue won the best new entry award in the Category of 'Best Presented Street'. Keadue's participation in the *Tidy Towns* Competition and their achievements to date instil a sense of pride and purpose in their community.

ACKNOWLEDGEMENTS

Keadue Tidy Towns would like to thank all of their members and volunteers for their tireless work in helping to promote biodiversity, sustainable living and an attractive environment in Keadue.

This Community Biodiversity Action Plan was created by Seán Meehan for Keadue Tidy Towns. Seán would like to thank the members of the group for their participation and enthusiasm throughout this project.

1. INTRODUCTION: THE ROSCOMMON BIODIVERSITY TRAINING PROJECT

ABOUT THIS BIODIVERSITY PROJECT

Ecologists Deborah D'Arcy, Seán Meehan and Billy Flynn were commissioned by Roscommon LEADER Partnership to work with communities in County Roscommon to provide biodiversity training and to facilitate the development of local biodiversity plans. The principal aim of this LEADER initiative was to increase awareness of the importance of biodiversity to communities but also to empower individuals and groups to make positive contributions for the benefit of both wildlife and people.

It is to the credit of the participant communities that biodiversity has become such a part of what they



do in their localities. This project will help groups to incorporate biodiversity matters into their present and future projects, maximising the benefits for wildlife as well as people. The training element of the project has

been completed and this phase now looks to build on this knowledge by providing a plan for biodiversity in each of the participating communities. As well as including detailed information on how to carry out projects, the plans will also be useful in raising awareness of how biodiversity is considered in these communities. This statement of best practice for biodiversity will also be useful to groups seeking financial or material support for future projects.

This biodiversity plan was drawn up following a series of workshops in each of the participating communities which included field trips, review of past, present and proposed community projects and meetings with the organising committees.

WHAT IS BIODIVERSITY?

Biodiversity refers to the variety of life on Earth. It includes all living things (organisms) that make up the natural world (including humans). Biodiversity also refers to the places where animals and plants live (habitats) and the complex interactions between living things and their environment which we call ecosystems.

WHY IS BIODIVERSITY IMPORTANT?

Humans are a component of biodiversity and we are dependent on biodiversity to provide a range of ecosystem services. Human activities such as agriculture, forestry and fishing depend on services provided by biodiversity. We rely on biodiversity for the provision of clean air and water, food and medicines, natural landscapes, flood control, noise pollution control and much more. A healthy environment is important for human health and well-being. Biodiversity provides us with natural amenities to enjoy, parks and green spaces, wildlife and landscapes to admire and thus improves our quality of life. The attractiveness of our country as a tourist

destination, a place to live and do business depends to a large extent on the rich biodiversity of the county. Our country's natural heritage contributes to the attractiveness of landscapes, villages and urban centres.

WHAT'S THE LOCAL BIODIVERSITY ACTION PLAN FOR?

The purpose of a Local Biodiversity Action Plan (LBAP) is to set out appropriate locally based actions for the conservation, management and/or enhancement of habitats for the benefit of native species. This local biodiversity action plan:

- Makes recommendations for the conservation of biodiversity through appropriate actions for the protection, management or appreciation of an area of high ecological value.
- Identifies actions to improve or enhance local areas so as to increase their value as habitats for species.
- Encourages actions to raise awareness of the importance of biodiversity and its conservation.

2. KEY ACTIONS FOR BIODIVERSITY

In this Section, we set out some of the actions that will be common to all of the participating groups and indeed all community groups interested in biodiversity. We also outline some of the guidelines that are accepted as best practice for biodiversity at local or wider levels.

2.1 HABITAT CREATION AND MANAGEMENT

Habitat creation is one way to increase the diversity of habitats and enhance an area for biodiversity. Examples of small-scale habitat creation that may be appropriate and practical for community groups, schools and residents to undertake include managing an area as meadow grassland or wildflower lawn, planting hedgerows, treelines or groves of trees or creating a pond.

Habitat creation should only be attempted in an area that is currently of low biodiversity value such as amenity grassland. Introducing a habitat uncommon in an area such as a pond may be of more benefit than planting more trees in an area that already has good tree cover. Creating a small complex of habitats such as a small woodland or grove of trees along with some meadow grassland around the edges to create a collection of semi-natural habitats will be of more benefit to biodiversity as it will provide resources for a greater number of species.

Tree and Hedgerow Planting

Planting native hedgerows, trees and woodlands provide food, shelter and niche habitats for a range of plant and animal life and is one of the easiest ways of increasing the biodiversity value of an area. Native trees and shrubs are best for wildlife. These species colonised Ireland naturally and have adapted to the environmental conditions here and other plant and animal life have adapted to co-exist with them.



Meadow grasslands and wildflower lawns

The traditional hay meadows once widespread in Ireland are now very scarce due to changes in farming practices. Meadows are a haven for wildlife in summer, being rich in wildflowers and the insects, birds and bats that depend on them. Managing little used grassland areas as a meadow is one way to increase the resources available to wildlife. This allows the growth of wildflowers which provide essential pollen for our pollinating insects. Long grass also hosts a variety of other insects and invertebrates and produce seed, both important food sources for birds. Bat species will forage over a meadow grassland rich in insect life. Long grass also provides cover and nesting habitat for birds and small mammals.

Making Meadows: Where and How to Encourage Wildflowers Naturally

Meadow grassland can be established in parkland areas or along grass verges. In general areas of meadow grassland or long grassy verges should be cut once a year in autumn and the cuttings removed. Removing the cuttings is important to prevent

the build-up of nutrients in the soil. Wildflowers flourish in a nutrient poor soil where they can compete successfully with the more competitive grasses. Gradually over the years the number and diversity of wildflowers within the meadow will increase. It may take several years before you see an increase. Avoid using commercially available wildflower mixes to enhance your meadow. These mixes often contain species that are not native to Ireland and are really only suitable for gardening and not for creating natural habitats such as meadows. In addition, some species in these mixes are plants of disturbed ground or arable fields and are unlikely to thrive in a meadow grassland.

Pollinator Friendly Planting

Much is spoken about the importance of pollinators these days, and rightly so. These are hugely important species for not only our wildflowers and trees but also for many of the plants on which we depend for food. Any biodiversity plan should have a strong focus on plants for pollinators.

While native plants are best for wildlife and should only be planted in wild areas, there are a wide range of both native and non-native garden plants which provide food for pollinating insects which can be used in gardens and formal plantings. However, some garden plants are not suitable for pollinators. Planting a range of pollinator

friendly plants which flower at different times throughout year will provide an important source of pollen and nectar for pollinating insects throughout the spring, summer and autumn.

Plants for Pollinators: Naturally Native

Here are some common (and sometimes overlooked) plants that are native to Ireland and County Roscommon and are of great benefit for our insect pollinators:

Dandelion, Daisy, Bluebell, Bugle, Red & White Clover, Ivy, Blackthorn, Hawthorn, Forget-me-not, Heather, Bramble, Primrose, Foxglove, Rowan, Spindle

Plants for Pollinators: Non-native but beautifully beneficial

Here are some widely available plants that are good for pollinators but also look great in any planting scheme:

Nepeta, Rudbeckia, Aubretia, Cotoneaster, Berberis, Ribes (currants), Buddleia, Hydrangea, Lavenders, Privet, Dogwood, Hebe, Cranesbills, Achillea, Campanulas

Composting

Compost your garden and food waste in a designated composting area. Composting reduces the amount of waste going to landfill and provides a source of nutrient rich compost for gardening. This reduces the need to purchase garden compost often sourced from peat bogs contributing to the loss of these treasured habitats. Your compost heap also becomes a habitat! Worms, beetles, slugs and even hedgehogs will make themselves at home in a well-managed composting area.

Avoid tipping garden waste into

waysides or wild areas. Grass cuttings disposed of in waysides and other wild places smothers wildflowers. Beside watercourses, grass cuttings can pollute water and even kill fish. Garden plants which are disposed of outside garden areas can take root and spread. Some garden plants can become very invasive and spread to wild areas outcompeting our native plants and can lead to damage of our natural habitats. Japanese knotweed, *Fallopia japonica*, is one such plant, and the dumping of garden cuttings along roadsides has aided its spread throughout Ireland.



Bee nesting habitat

Honeybees live in hives and are looked after by beekeepers. Our wild bees do not enjoy such protection and must find a suitable place to nest. Bumblebee colonies make their nest on the ground often amongst long grass or other vegetation. Cut such long grassy verges between September and March so as to avoid disturbing bumble bee nests.

Solitary mining bees make their nest in tiny burrows in south/east facing banks of bare soil, sand, or peat. Keep vegetation sparse on

any earth banks or stony banks to provide nest sites for solitary bees. Scrape back to bare soil annually during October to February to create bare ground for solitary bees to burrow into.

Cavity nesting bees make their nests in south/east facing stonewalls, masonry, cavities in wood or dead plant stems. Visit such areas on a sunny evening from May -September. If bees are seen, protect these areas from disturbance and, in particular, ensure that there is no herbicides or pesticides used near these areas. Additional nest sites can be provided by drilling holes in fence

posts (10 cm deep and 4-8mm in diameter).

Herbicides and pesticides

We would recommend that you avoid the use of herbicides and pesticides as they cause harm to wildlife directly and indirectly. For example, using slug killer might result in fewer thrushes, hedgehogs and other slug-eating wildlife. Using herbicides to control 'weeds' along grassy verges and around trees kills wildflowers which wildlife depend on for food and seeds.

KEY ACTIONS FOR BIODIVERSITY (CONTINUED)

2.2 PROTECTING BIODIVERSITY

Conserving and protecting biodiversity is sometimes as simple as getting the time right. Scheduling management actions to avoid or minimise disturbance to wildlife is crucially important.

Without management, hedgerows can become 'gappy', reducing their value to wildlife and their stock-proofing function. Under the Wildlife Act 1976, as amended, it is illegal to cut hedges between 1st March and 31st August in order to protect nesting birds unless there are clear traffic health and safety reasons to do so.

Hedgerows should be cut back



about every 3 years in rotation. This means that not all the hedgerows are cut in any one year, allowing some to be left uncut to provide resources for wildlife. Hedgerows can be cut between September and March but cutting hedgerows later in the autumn, in November or December is less disruptive to pollinating insects.

Hedgerows should be cut to an 'A' shape which allows sunlight to reach the bottom of the hedge, promoting a full and dense growth. The top of the hedge should be left uncut to leave some fruit and seeds through the autumn and winter months for birds to feed on.

Similarly delaying the annual garden clean-up normally carried out in autumn until early spring provides some additional shelter for wildlife. Dead plant stems and fallen leaves provide places for invertebrates and other small wildlife to shelter and hibernate during the winter months.

2.3 RAISING AWARENESS

Community groups such as Tidy Towns groups and Resident's Associations play a really important role. Raising awareness of biodiversity and encouraging or facilitating people to engage with and appreciate wildlife is an important tool in biodiversity conservation. Providing opportunities for people to experience biodiversity is useful to draw peoples' attention. Even more effective, however, is increasing the amount of time people spend outdoors connecting with nature. Furthermore, the health benefit of spending time with nature is widely recognised with known benefits for both physical and mental wellbeing.

Raising awareness of biodiversity can be facilitated by organising wildlife-themed walks, bat walks, wildflower walks and bird watching or competitions,

such as best wildlife-friendly estate, best garden for wildlife or a wildlife photography competition. Better still is providing opportunities for people to volunteer on a project, such as invasive plant species removal, tree planting or encouraging people to get involved in citizen science projects. It is often the social benefits of such events that will attract people to get involved.

When residents understand more about wildlife in their local area, this can instil respect, remind them of the value of nature and lead to more effective conservation. Where appropriate, interpretative signage highlighting the biodiversity present in an area or promoting a particular biodiversity project can be useful means to get people involved in Citizen Science.

2.4 CITIZEN SCIENCE: WE CAN ALL BE ENVIRONMENTAL SCIENTISTS

Citizen science engages the public to participate in recording wildlife. Keeping records of wildlife species and submitting these records to the National Biodiversity Data Centre (NBDC) (www.biodiversityireland.ie) or other dedicated recording scheme

is a great way to get people involved in biodiversity conservation, improve skills in wildlife identification and foster a personal appreciation of nature. All records are valuable, even of common species seen every day. Such data is very important and is

used in research, policy formation and contributes greatly to our knowledge of biodiversity and its conservation. The NBDC runs annual one-day wildlife identification training courses.

3. KEY PROJECTS FOR BIODIVERSITY IN KEADUE

Keadue and environs

Keadue (*Céideadh*, ‘low lying hill’) is a village in north County Roscommon, close to the Co. Sligo border. The landscape is dominated by Arigna Mountain and Lough Meelagh. The closest designated site for wildlife and habitats is Kilronan Mountain Bog NHA, NPWS site code 000617, approximately 1.6km

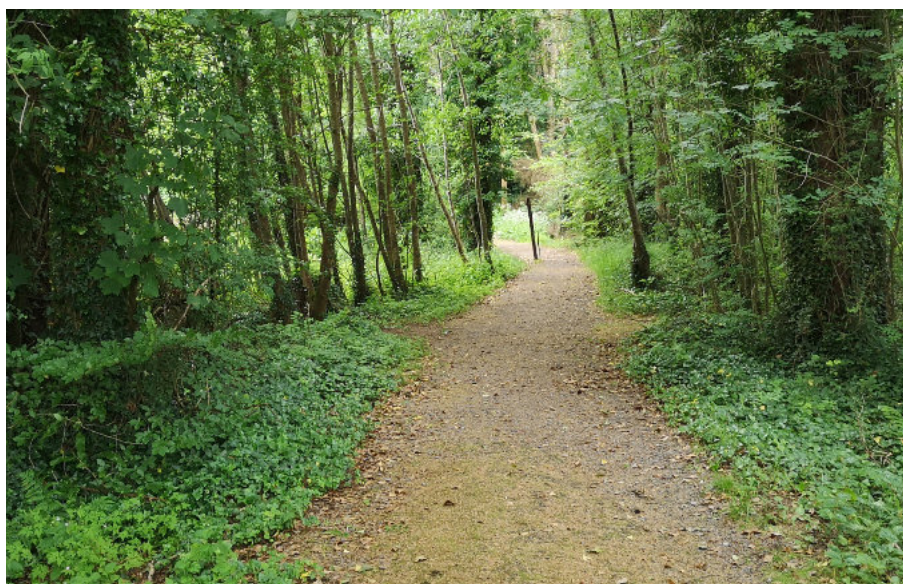
north of Keadue. An NHA or National Heritage Area is a site designated for the conservation of a particular habitat or species. Kilronan Bog is an example of an area of relatively intact upland blanket bog. Species of conservation concern found here include red grouse *Lagopus lagopus scotica* and Irish hare *Lepus timidus hibernicus*.

Knockranny Wood on the shore of Lough Meelagh is located approximately 1km from the village and is a valuable and interesting local biodiversity feature.

Four key biodiversity projects, in addition to a number of smaller ones, have been identified and are detailed below.

KEY PROJECT 1

KNOCKRANNY WOOD - ECOLOGICAL AUDIT - CITIZEN SCIENCE



Trail through Knockranny Woods. Below, Enchanter's Nightshade (*Circaea lutetiana*) in Knockranny Wood - a species associated with long established woodland habitats.



Knockranny Wood is a stand of mature mixed woodland, formerly part of the Kilronan Estate. The woodland is located along the south east shoreline of Lough Meelagh and there is a jetty, carpark and signed walking trails in place. Coillte have planted areas of the woodland with non- native conifer species, however broadleaf stands of woodland still remain, providing an important habitat for biodiversity. A biodiversity audit of the woodlands was carried out in 2014 and resulted in basic species lists being compiled. Funding should be sought to provide training workshops in woodland flora and fauna for the community to enable more detailed audits to be undertaken in 2020 or 2021. A joint project with Mount Allen Organic farm to deliver training for the public should be considered. This citizen science project would help to raise awareness of the importance of this woodland habitat for local biodiversity. Records of species should be submitted to the National Biodiversity Datacentre (NBDC).

Project Period: 2020 - 2021

PROJECT 2

KNOCKRANNY WOOD CAR PARK - WILDFLOWER MEADOW CREATION



Area of grassland identified as a site for a wildflower meadow

An area of grassland by Knockranny Wood is currently maintained by regular mowing. The adoption of a suitable cutting regime could transform this area into a wildflower meadow, complimenting the biodiversity value of this area. As the sward contains some wildflower species already, an appropriate cutting regime, rather than removing the sod and re-seeding with wildflower seed, is preferable. See the link in the resources table for further information on wildflower meadow creation and maintenance.

Project Period: 2019-2021

PROJECT 3

BIODIVERSITY ENHANCEMENT AT PADDY DUIGNAN'S GARDEN

This small garden, located on the junction of the R284 and R285 roads, has been enhanced for biodiversity. To further increase biodiversity value, the removal of conifer trees should be undertaken and replaced with native varieties of apple trees.

Project Period: 2019-2020



Paddy Duignan's Garden is already managed with biodiversity in mind

PROJECT 4

CREATION OF WILDFLOWER MEADOW IN GREEN AREA AT LUAS BEG



Area of grassland identified as a site for a wildflower meadow

This large area of grassland is currently managed as a lawn, resulting in minimal biodiversity value. A section of this green area, with consultation and input from local residents, should be managed to achieve a more diverse wildflower meadow. See the link in the resources table for further information on wildflower meadow creation and maintenance.

In addition, the planning of native trees and shrubs in appropriate areas of this green should also be considered.

Project Period 2020 - ongoing

4. KEADUE TIDY TOWNS BIODIVERSITY PROJECT SCHEDULE

No.	Project	Milestones	Project Period
1	Knockranny Wood - ecological audit - citizen science	<ul style="list-style-type: none"> Seek funding deliver training workshops in woodland flora and fauna identification Possible tie-in with Mount Allen Organic Farm to deliver ecological training. Promote the biodiversity audits and compile a survey schedule Submit records to the NBDC 	2019-2021
2	Knockranny Wood car park - wildflower meadow creation	<ul style="list-style-type: none"> Undertake appropriate grassland management Continue with annual maintenance of the meadow Monitor wildflower species over a number of seasons 	2019 - 2022
3	Further enhancements at the Paddy Duignan's Garden	<ul style="list-style-type: none"> Remove conifer trees and replace with native apple varieties Continue planting pollinator friendly plants Install bat and bird boxes on suitable trees in and around the garden 	2019 - 2020
4	Creation of a wildflower meadow in green area as Luas Beg	<ul style="list-style-type: none"> Notify local residents and Roscommon County Council about the planned project Undertake appropriate grassland management Continue with annual maintenance of the meadow Monitor wildflower species over a number of seasons 	2020 - ongoing
5	Roadside Verge Maintenance for Pollinators	<ul style="list-style-type: none"> Identify areas around Keadue for implementing a roadside verge management plan Consultation/communication with Roscommon County Council This action will compliment Keadue's plans for the '<i>Entente Florale Competition</i>' in 2020. 	2020-ongoing
6	Increase planting of pollinator plants in the village	<ul style="list-style-type: none"> Increase the planting of native and pollinator flowers in the village in the run up to the '<i>Entente Florale Competition</i>' in 2020. 	2020
7	Public events to engage the community	<ul style="list-style-type: none"> Hold an annual public biodiversity themed event. A bat watch evening at Knockranny Wood during Heritage Week 2019 attracted considerable public interest. 	2020 - ongoing

5. PROJECT RESOURCES

The following online resources are available to help Keadue Tidy towns promote and enhance biodiversity in their locality:

- Wildflower meadow information: <https://www.biodiversityireland.ie/wordpress/wp-content/uploads/Pollinator-How-to-Guide-4-wildflower-FINAL.pdf>
- NPWS - Kilonan Mountain NHA <https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY000617.pdf>
- Mount Allen Organic farm – tommy@mountallenecotours.com
- Native Irish plants and seed <http://www.irishseedsavers.ie/>
- Community actions for pollinators: https://pollinators.ie/wordpress/wp-content/uploads/2018/04/Local-Communities_actions-to-help-pollinators-2018-WEB.pdf
- Pollination related signage: <https://pollinators.ie/resources/>
- Citizen Science record submission: <http://www.biodiversityireland.ie/record-biodiversity/>
- Bumblebee Identification guides: <https://pollinators.ie/record-pollinators/id-guides/>
- Butterfly identification: <http://www.biodiversityireland.ie/record-biodiversity/butterfly-monitoring-scheme/about/how-to-identify-butterflies/>
- Composting information: <https://stopfoodwaste.ie/>



*Lough Meelagh,
Keadue, Co.
Roscommon*

This Local Biodiversity Action Plan was written for Keadue Tidy Towns by Seán Meehan, Ecological Consultant. Thanks to all the volunteers and supporters of this biodiversity plan

Photographs are by the author.

September 2019

APPENDIX A

1.1 GUIDELINES FOR PLANTING A NATIVE HEDGEROW

WHICH SPECIES?

- The best guide is to look at hedgerows growing locally and plant the same native species.
- Plant native species which are adapted to Irish conditions and benefit wildlife more.
- Locally grown plants, tolerant of local conditions, are likely to thrive.
- Plants grown from locally collected seed conserves local provenance.
- Thorny species such as hawthorn or blackthorn are essential for a stock proof hedgerow.
- A variety of species provides a varied food supply throughout the year for more wildlife. Include another hedgerow species or climber approximately every metre for stock proof hedgerows.
- If stock proofing is not a consideration plant 4 or 5 different species for a species-rich hedgerow.
- Include a tree species at irregular intervals, provided it will be allowed to grow up and is NOT topped when routinely trimming the hedgerow.
- Avoid non-native trees that cast dense shade, such as sycamore, beech and chestnut.
- If native varieties are not available, do not use ornamental garden varieties as they crowd out the desired plants and are not so good for biodiversity.

HEDGEROW SPECIES

These species survive routine trimming as a hedgerow while individual stems can be allowed to grow up and mature into trees.

- Hawthorn (*Crataegus monogyna*): Predominant hedgerow species. Hardy, fast-growing and tolerates most soils except very wet.
- Blackthorn (*Prunus spinosa*) suits most soils except very wet. Suits exposed and coastal sites. Spreads by suckers, good for gapping up.
- Holly (*Ilex aquifolium*): slow growing evergreen. Tolerates exposed sites and shade. Suitable under trees. Male and female plants required for berries.
- Spindle (*Euonymus europaeus*): prefers alkaline, but tolerates a wide range of soils. Open, infertile site better for fruit production.
- Guelder rose (*Viburnum opulus*): prefers alkaline, fertile, clay soils and neutral wet soils. Acid soils unsuitable. Competitive in new hedgerows.
- Hazel (*Corylus avellana*): prefers heavier, fertile soils. Tolerates some shade. Understory species.

CLIMBERS

Climbers colonise hedgerows, but can be planted.

- Dog rose (*Rosa canina*): tolerates wide range of soils. Provides rose hips.
- Honeysuckle (*Lonicera periclymenum*): prefers neutral to light acid soils. Notable scented flowers.

TREES

These trees are suitable in hedgerows, provided they are allowed to grow up and mature and are not topped when trimming the hedgerow.

- Alder (*Alnus glutinosa*): useful for very wet sites and river banks. Adapted to most soils. Ideal nurse species as shelters new hedgerows and fixes nitrogen.
- Crab apple (*Malus sylvestris*): thrives in all fertile and heavy soils.
- Downy birch (*Betula pubescens*): suits poorly drained peat.
- Silver birch (*Betula pendula*): needs good drainage and sunny site.
- Willows (*Salix* spp.): useful for wet sites and stabilising river banks. Tolerate flooding. Fast growing.
- Wild cherry (*Prunus avium*): prefers fertile soils. Wet soils unsuitable. Shallow rooting. Tolerates some shade. Susceptible to bacterial canker.
- Rowan (*Sorbus aucuparia*): grows in poor thin acid soils. Suits exposed sites. More fruit in open infertile sites.
- Wych elm (*Ulmus glabra*): Suitable for sandy, loamy and clay soils but prefers well drained soil. Suits acid, neutral and basic soils.
- Pedunculate oak (*Quercus robur*): prefers clay soils and damp lowlands. Poorly drained infertile soils unsuitable.
- Ash* (*Fraxinus excelsior*): prefers well drained neutral to alkaline soils. Tolerates exposed or coastal areas. Shallow rooting system doesn't suit tillage fields. Casts shade.

*Note: Due to the spread of ash dieback disease (*Chalara fraxinea*) planting large numbers of ash trees is not recommended and planting ash is not grant aided.

APPENDIX A

1.1 GUIDELINES FOR PLANTING A NATIVE HEDGEROW (CONTINUED)

HEDGEROW PLANTING

WHEN?

Hedgerow planting should be done during the tree planting season between November and February. To make planting easier, cover the ground with black polythene at least 6 months before hand to suppress existing vegetation.

SPACING

- It is recommended to plant 7 plants/metre in a double staggered row. This means a spacing of 300mm (1') between plants in each row and at least 300mm (1') between the two rows. Of the 7 plants in every metre, at least 6 should be hawthorn for a stock proof hedgerow.
- The other plant in every metre should come from the list above which tolerate routine trimming.
- If stock proofing is not a consideration then a more species rich hedge can be planted choosing up to four species from the list above.

PLANTING

- Prepare the ground and ensure that plant roots do not dry out. This can be done by keeping them in their bag in a cool place until planting or dig them into a temporary trench. During planting, avoid exposing the plants to air.
- Dig a trench and plant to the same depth as previously planted in the nursery.
- Hawthorn, blackthorn and dog-rose should be cut back to 100mm (4") from ground level to promote shoots at this level. Leave a few hawthorns un-pruned, placing tree shelters on them to identify and protect as single stemmed mature trees.
- Identify a few other species for retention as single stemmed trees. Trees such as pedunculate oak, ash and rowan are also suitable.
- Retain approximately ten single stemmed small trees per 300 m; too many make hedge cutting difficult and cast shade on the hedgerow.

ON-GOING MANAGEMENT

- Water in dry weather
- Control competing vegetation to prevent smothering and allow lower branches develop, giving a dense base.
- Manual weeding
- Mulching immediately after planting helps weed control. Mulch such as wood chippings, paper or cardboard must extend 150mm outside the plants.
- Fence off livestock using temporary fencing. Consider livestock reach and future access for machine trimming, when positioning the fence. Rabbit proof fencing may be needed to protect from rabbits or hares.
- Replace plants which fail to grow.
- For the first few years after planting, cut hawthorn back to 75mm (not other species) above previous level of cut, gradually shaping into a triangular profile.

BIBLIOGRAPHY:

Teagasc (2009). Countryside Management Series 4 New Farm Hedgerows.
Tree Council of Ireland. www.treecouncil.ie

APPENDIX B

The following table provides a list of some pollinator friendly plants. The list is not exhaustive and your local nursery can advise on other pollinator friendly plants.

Important: In towns and villages non-native horticultural or ornamental plants can be an important additional food source for pollinators. It is important to choose species that are good sources of nectar and pollen. However, you should not plant these in natural or semi-natural habitats. They should also not be planted in farmland (outside of farm gardens).

SOME POLLINATOR FRIENDLY PLANTS

TREES AND SHRUBS

SPRING	SUMMER	AUTUMN/ WINTER
Apple (<i>Malus sp.</i>)	Rock Rose	Hebe
Field maple (<i>Acer campestre</i>)	Horse chestnut (<i>Aesculus</i>)	Ivy
Willow (<i>Salix sp.</i>)	Deutzia	Honeysuckle (<i>Lonicera sp.</i>)
Crab apple (<i>Malus sylvestris</i>)	Firethorn (<i>Pyracantha sp.</i>)	Tree ivy
Wild Cherry (<i>Prunus avium</i>)*	Laburnum	Barberry (<i>Mahonia</i>)
Rowan (<i>Sorbus aucuparia</i>)*	Viburnum	Musk willow (<i>Salix aegyptiaca</i>)
Broom (<i>Cytisus sp.</i>)	Foxglove tree (<i>Paulownia tomentosa</i>)	Sweet box (<i>Sarcococca confusa</i>)
Forsythia	Blackcurrant (<i>Ribes nigrum</i>)	Sweet box (<i>Sarcococca hookeriana</i>)
Viburnum sp.	Redcurrant (<i>Ribes rubrum</i>)	
Bird cherry (<i>Prunus padus</i>)*		
Hawthorn (<i>Crataegus monogyna</i>)*		
Juneberry Tree <i>Amelanchier</i> x		

SOME POLLINATOR FRIENDLY PLANTS

PLANTS AND HERBS

SPRING	SUMMER	AUTUMN/ WINTER
Hellebores (<i>Helleborus sp.</i>)	Columbine (<i>Aquilegia</i>)	Heathers
Rosemary (<i>Rosemarinus officinalis</i>)	Yarrow (<i>Achillea</i>)	Lavender (<i>Lavandula</i>)
Castor Oil plant (<i>Fatsia japonica</i>)	Bistort (<i>Persicaria bistorta</i>)	Asters
Bugle* (<i>Ajuga reptans</i>)	Angelica (<i>Angelica</i>)	Catmint (<i>Nepeta</i>)
Aubrieta	Bell flowers (<i>Campanula</i>)	Raspberry (<i>Rubus</i>)
Wallflower (<i>Erysimum</i>)	Chives (<i>Allium</i>)	Eupatorium
Cranesbills (<i>Geranium</i>)	Comfrey (<i>Symphytum</i>)	Scabious (<i>Knautia, Scabiosa</i>)
Blueberry (<i>Vaccinium</i>)	Foxglove (<i>Digitalis</i>)	Snapdragon (<i>Antihirrhums</i>)
Skimmia (<i>Skimmia japonica</i>)	Hebe	Sunflowers (<i>Helianthus</i>)
Pasque flower (<i>Pulsatilla vulgaris</i>)	Lupin (<i>Lupinus</i>)	Ivy (<i>Hedera helix</i>)
Spurges (<i>Euphorbia sp.</i>)	Monkshood (<i>Aconitum</i>)	Chrysanthemums
Lungwort (<i>Pulmonaria sp.</i>)	Sage (<i>Salvia</i>)	Borage (<i>Borago</i>)
Perennial candytuft (<i>Iberis sempervirens</i>)	Thyme (<i>Thymes</i>)	Majoram (<i>Origanum</i>)
Elephant ear (<i>Bergenia sp.</i>)	Coneflower (<i>Echinacea purpurea</i>)	Knapweed (<i>Centaurea</i>)
Leopard's bane (<i>Doronicum × excelsum</i>)	Bell Heather (<i>Erica cinerea</i>)*	Larkspur (<i>Delphinium</i>)
Green alkanet (<i>Pentaglottis</i>)	Red Turtlehead (<i>Chelone obliqua</i>)	Dahlia species & hybrids (Dahlia)
	Bugbane (<i>Actaea simplex</i>)	Salvia species (Sage - autumn-flowering)
	Bee Balm (<i>Monarda</i>)	<i>Aconitum carmichaelii</i> (Carmichael's monk's)
	Oxeye sunflowers (<i>Heliopsis sp.</i>)	<i>Helianthus × laetiflorus</i> (Perennial sunflower)
	Black-eyed Susan (<i>Rudbeckia</i>)	<i>Leucanthemella serotina</i> (Autumn ox-eye)
	Wallich Mil Parsley (<i>Selinum wallichranum</i>)	Majoram (<i>Origanum</i>)

SOME POLLINATOR FRIENDLY PLANTS

BULBS

SPRING	SUMMER	AUTUMN/ WINTER
Winter aconite (<i>Aconitum</i>)	Onion (Allium species ornamental and edibles)	Colchicum species (Autumn crocus)
Bluebell*(<i>Hyacinthoides non-scripta</i>)		Russian Sage
Crocus		Winter aconite (<i>Eranthis hyemalis</i>)
Grape hyacinth (<i>Muscari armeniacum</i>)		Snowdrop (<i>Galanthus sp.</i>)
Single flowered dahlia		



APPENDIX C

CONSTRUCTING BIRD BOXES AND SELECTING THEIR LOCATION

1.

Use a plank of wood about 150 mm wide and 15 mm thick. Cut out pieces to the dimensions opposite. The bottom of the entrance hole must be 125 mm from the floor. The inside wall below the entrance hole should be rough to help the young birds to clamber up when it's time for them to leave.

2.

When assembling the box use screws or galvanised nails.

3.

Attach the lid with a brass or a plastic hinge that will not rust, or hinge it with a strip of leather or rubber (an old piece of bicycle inner tube will do). Fasten it down with a good catch. Do not nail down the lid, since you will need to clean out the box in the autumn

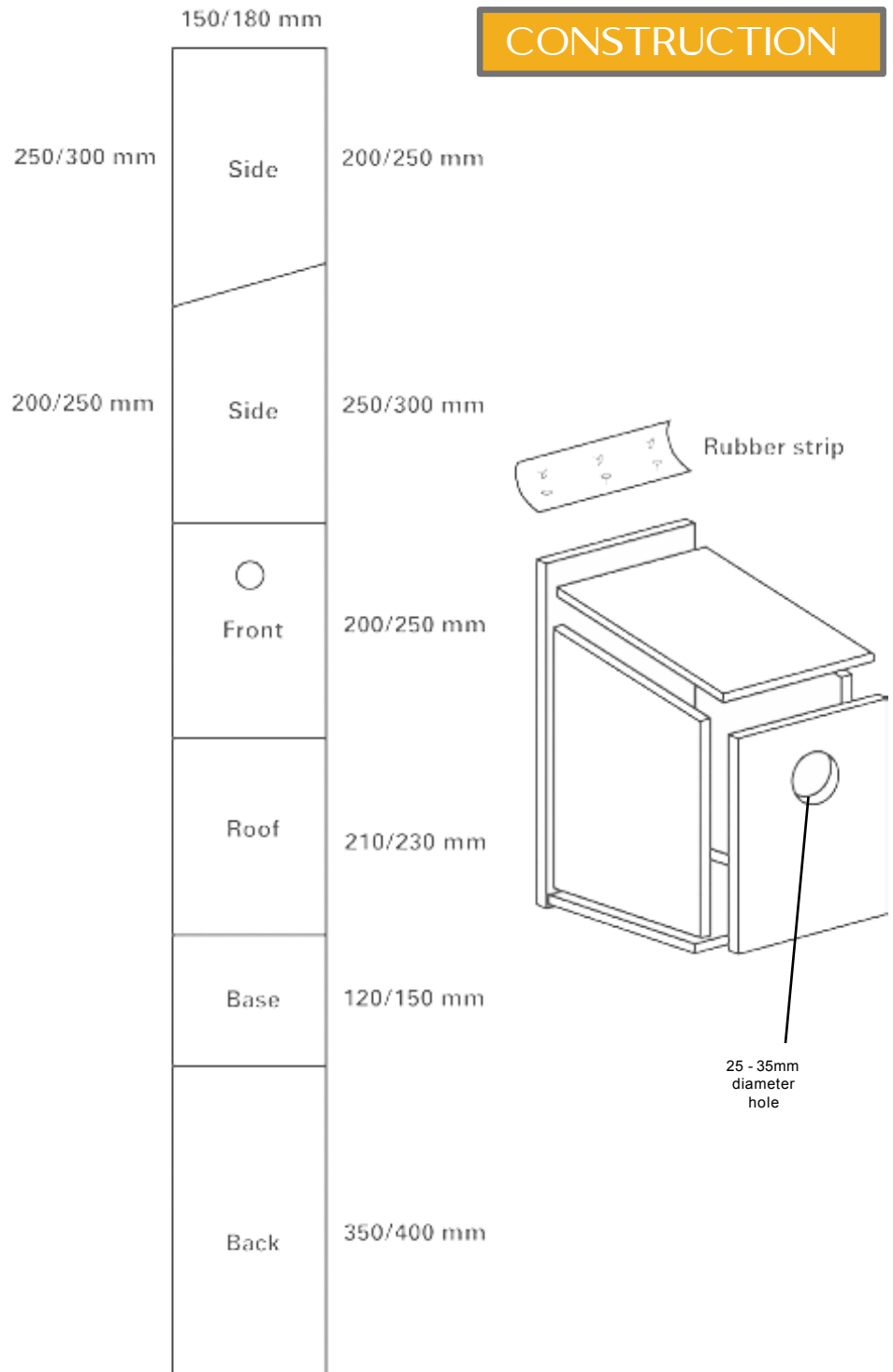
4.

By altering the size of the hole you can make a box to suit different species.

- Blue tit and coal tits~25 mm
- Tree sparrow~28 mm
- House sparrow~32 mm

5.

It is best to use hardwood and leave the wood untreated. Softwood boxes can be treated with selected water-based preservatives, which are known to be safe for animals, such as Sadolin.



CONSTRUCTION

MAKE THE SAME BOX WITH THE UPPER HALF TAKEN AWAY ALTOGETHER FOR ROBIN, PIED WAGTAIL AND WREN.

LOCATION SELECTION

Put your nest box up before the start of the breeding season in February. If you put the box up in winter and put a small handful of wood shavings inside, birds may roost in it for warmth.

Don't use straw as this will become damp and mouldy over the winter. The box should be located at least 2 m from the ground (preferably 3-5 m) so cats, other predators and curious people (especially children) don't disturb the nesting birds.

Choose a location that is situated away from bird tables and feeders as nesting birds are territorial and may feel threatened by other birds

feeding nearby. Unless there are trees or buildings which shade the box during the day, face the box between north and south-east, thus avoiding strong sunlight and the wettest winds. Make sure that the birds have a clear flight path to the nest box without any obstructing vegetation directly in front of the entrance. Tilt the box forward slightly so that any driving rain will hit the roof and bounce clear.

Use a wire strap to attach the box to a tree to avoid damaging the tree and check annually to ensure the wire is not cutting into the tree trunk.

Open-fronted boxes for robins and wrens need to be situated low down, below 2 m, well hidden in vegetation such as dense bramble thickets.

NEST BOX CARE

If birds take up residence in your nest box, avoid going near the box or disturbing the nest as this may result in the parent birds abandoning their young. Observe and admire the activity from afar, preferably from inside looking through a window.

The box can be opened from the end of October and cleaned out. Empty out old nest material and any unhatched eggs and clean the inside of the box with boiling water to kill off any parasites that may be still in the box.



APPENDIX D

CONSTRUCTING BAT BOXES AND SELECTING THEIR LOCATION



Bats are social animals and often congregate in large numbers. Providing bat boxes offer bats additional roosting areas, or can often help to replace lost or degraded roosting sites such as demolition of old buildings.

BAT BOX CONSTRUCTION

There are many designs for bat boxes. Check the resources page for alternatives. Bat boxes should be draught free and preferably painted black with a non-toxic paint to allow for maximum absorption of heat during the day

that keep the bats warm. The bat box described below is for summer occupancy since it lacks the required insulating properties to make it suitable for a hibernation site.

MATERIALS AND CONSTRUCTION

- The only critical measurement is the width of the crevices: between 15-20mm.
- This kit requires approximately 1.6m of rough wood and 25 screws (8 x 1 ½ inches) to assemble

- Pre-drill the holes to prevent the wood splitting.
- Box should be made from untreated rough sawn timbers.
- Timber should be about 20 mm thick.
- The box should be rainproof and draught-free.
- Crevices can be between 15-20 mm wide
- Fixings may be by use of brackets, durable bands or wires

LOCATING YOUR BAT BOX

Bat boxes are best positioned as high as possible but at least 4 or 5 m from the ground in a sheltered and wind free position, exposed to the sun for part of the day (6-8 hours). They can be fitted to walls, other flat surfaces and trees. A clear flight line to the entrance is important. Ideally put up 2-3 boxes in a group with varying aspects ranging from south east to south west, e.g. around a tree trunk, as bats may move between roosts to remain comfortable.

Bats are nocturnal and adapted to low light conditions. Artificial light sources should not be directed onto bat boxes or flight paths as most bat species find artificial lighting very disturbing. Don't position bat boxes in areas that are illuminated at night.

Bat boxes are more likely to succeed in areas where bats are frequently found in buildings and where there is a good mixture of habitat such as trees nearby. Bat boxes may be more successful if located close to a linear feature such as a line of trees or hedgerow. Some bat species use these features for navigation between their roosting sites and feeding grounds thus avoiding flying in open and exposed areas. Ensure the bats approach to the

box is not impeded, for example by branches – clear away underneath the box so the bats can land easily before crawling up into the box.

If fixing the box to a tree, use headless or domed nails not fully hammered home to allow the tree to push the box off without splitting, or strap the box to the tree. Iron nails can be used on trees with no commercial value. Copper nails can be used on conifers, but aluminium alloy nails are less likely to damage saws and chipping machinery.

On buildings, place the boxes as high as possible to reduce the likelihood of the bats falling prey to cats or being disturbed by humans. As with trees, the aspect of the box on the building should capture sun for part of the day.

MONITORING BAT BOXES

Making and erecting bat boxes is a great conservation action but what is more beneficial is to establish whether they are being used, at what time of year and by which species. There are nine species of bat found in Ireland.

HOW LONG BEFORE BATS USE THE BOX?

Sometimes it may take several years for the bats to find the box. Be patient!

It is highly unlikely bats will shift their roost from a well-used site to a newly positioned box and there may be plenty of other suitable roosting sites in the area. However, at other times bats will use the box within a few months, and if you are extremely lucky, maybe even within a few weeks!

HOW WILL I KNOW IF THE BOX HAS BEEN SUCCESSFUL?

To check if the box is being used, look out for droppings, urine staining, listen for 'chattering' and watch the box for an hour either side of sunset to observe any bats leaving to feed.

Remember disturbance of a bat roost is an offence under the Wildlife Acts 1976 and 2000). Therefore, a bat box should not be opened or interfered with unless the person is licensed to do so.

APPENDIX E

BIODIVERSITY RECORDING



Submitting records of species that you have observed and submitting them to the National Biodiversity Data Centre (NBDC) or another dedicated recording scheme is a great and practical means to become involved in biodiversity conservation. You are also improving your wildlife identification skills and getting ‘back in touch with nature’. Such data is very important and is used in research, policy formation and contributes greatly to our knowledge of biodiversity and its conservation.

The NBDC collate records of all species recorded, in addition to running targeted recording schemes such as the butterfly and bumblebee recording schemes. Anyone can get involved and they are keen to recruit new recorders. Visit www.nbdc.ie for details.

HOW TO STORE AND SUBMIT RECORDS

The information recorded needs to be as accurate as possible. To take an accurate record you need to:

- Correctly identify the species (or get help in doing so)
- Record when (the date) and where you saw it. For the location, you need a grid reference. You can submit records to the NBDC centre through their online records submission form. This has a “find a

grid reference feature” to easily find an accurate location for your record.

- You can also submit records for any wildlife species using their Biodiversity Smartphone App.

The number of conservation organisations running citizen science recording projects in Ireland is continually increasing:

- Birdwatch Ireland run the Garden Bird Survey and other more specialised recording schemes such as the Countryside Bird Survey, Irish Wetlands Bird surveys (iWeBS). They also coordinate ‘species action projects’ such as the Swift Nest Box project and Barn Owl Project which you may be able to get involved with. Visit www.birdwatchireland.ie
- The Irish Wildlife Trust also run targeted recording schemes such as for smooth newt and common lizard. Visit www.iwt.ie
- For botanical recording contact the Botanical Society of Britain and Ireland (BSBI). The BSBI run several outings a year and are very encouraging to new and emerging botanists and members. Visit <http://www.bsbi.org.uk/ireland.html>
- Submit wildlife sightings and sightings of road kill to www.biology.ie



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