Fenit Biodiversity Action Plan

FENIT
Development
Association

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FENIT Development Association

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1 INTRODUCTION

1.1 BACKGROUND

Malachy Walsh and Partners were commissioned by Fenit Development Association to complete a Biodiversity Action Plan for Fenit.

1.2 WHAT IS BIODIVERSITY AND WHY IS IT IMPORTANT?

Biodiversity is simply a shortened version of the term 'biological diversity', and it refers to the huge variety of life on the planet. Biodiversity is just another term for nature, flora and fauna, wildlife, ecology and natural heritage. More formally, biodiversity is comprised of several levels, starting with genes, then individual species, then communities of creatures and finally entire ecosystems, such as forests or coral reefs, where life interplays with the physical environment. These myriad interactions have made Earth habitable for billions of years.[1]

Biodiversity sustains life on Earth. A healthy biodiversity provides a range of natural ecosystem services including the protection of our water, formation of soils, nutrient storage and recycling, contribution to climate stability. We depend on the biological world for food, wood and medicines. Pollinators such as bees are critical for agriculture and our food supply for example. The natural world around us provides us with natural amenities and in Fenit these are the sea, beach, rocky shores, sand dunes, trees and scrub, and hedgerows and gardens.

All organisms have a value in themselves and should be valued and respected for themselves. All species of plant and animal have a long evolutionary heritage, often much longer than humans, and are as worthy of being preserved as we are.

1.3 WHAT ARE THE THREATS TO BIODIVERSITY?

Declining biodiversity is therefore a concern for everybody, which can arise from changes in how we use our seas and lands, the pollution we emit and the resulting climate change. Our rivers and seas are under threat from pollution, agriculture and our cities, towns and villages. Conversion of semi-natural grasslands, scrub and wetlands for use for intensive agricultural is one of the main threats to biodiversity in Ireland.

For instance, Irish pollinators are in decline due to a loss of natural and semi-natural (modified by human influence) habitats and to ensure the sustainability of our food production action is required. A 2006 assessment revealed that across the island, 30 of our 99 bee species are at risk of extinction. The majority (78%) of European flowering plant species are animal pollinated, as are 71 of the 100 crops that provide 90% of the world's food supply. The All-Ireland Pollinator Plan was developed to protect pollinators and is about providing food and shelter across all types of land so that our pollinators can survive and thrive. The most important pollinators in Ireland are insects, particularly bees and flies.

In Fenit the main pollution pressures on the land come from agricultural activities including the application of fertiliser and potential urbanisation. One of the main risks to biodiversity include scrub

[1] https://www.theguardian.com/news/2018/mar/12/what-is-biodiversity-and-why-does-it-matter-to-us

clearance and pesticide application. The main pollution pressures on coastal waters at Fenit are from agricultural run-off including fertiliser, emissions from sewage treatment and port related activities. Sewage in Fenit is only subject to primary treatment, which means solids settle but dissolved impurities are not removed, and these pollutants are then directly released into the marine waters west of Fenit. Irish Water have planned to build a new wastewater treatment plant at Fenit, which will provide better treatment for wastewater and additional capacity for new development.

1.4 PROTECTION OF BIODIVERSITY

In Ireland, biodiversity is protected through two European Directives including the Habitats and Birds Directives. Tralee Bay including Fenit Harbour is designated under the Habitats Directive as a Special Area of Conservation (SAC) for a host of marine and coastal habitats. Barrow Harbour and the coastline to the west of Fenit is also a SAC for the protection of its sand dunes and salt marsh. Inner Tralee Bay and Barrow Harbour including the sand spit at Fenit Island is protected under the Birds Directive as a Special Protection Area (SPA) for birds that feed on the large expanse of mudflats and sandflats during winter months from high-Artic Canada and northern Europe. Fenit is therefore surrounded by nature and wildlife that is of international importance in its SAC's and SPA.

Our own Wildlife Act protects ecologically important areas as Natural Heritage Areas (NHAs). There are two proposed NHAs close to Fenit, namely, Tralee Bay and Barrow Harbour, however, proposed NHAs have limited protection in law. Derrymore Island and Tralee Bay are Nature Reserves and protected under the Wildlife Act.

While these areas were considered in the preparation of this plan, the focus of the plan is the village and surrounds where nature of local importance exists and is also worthy of protection.

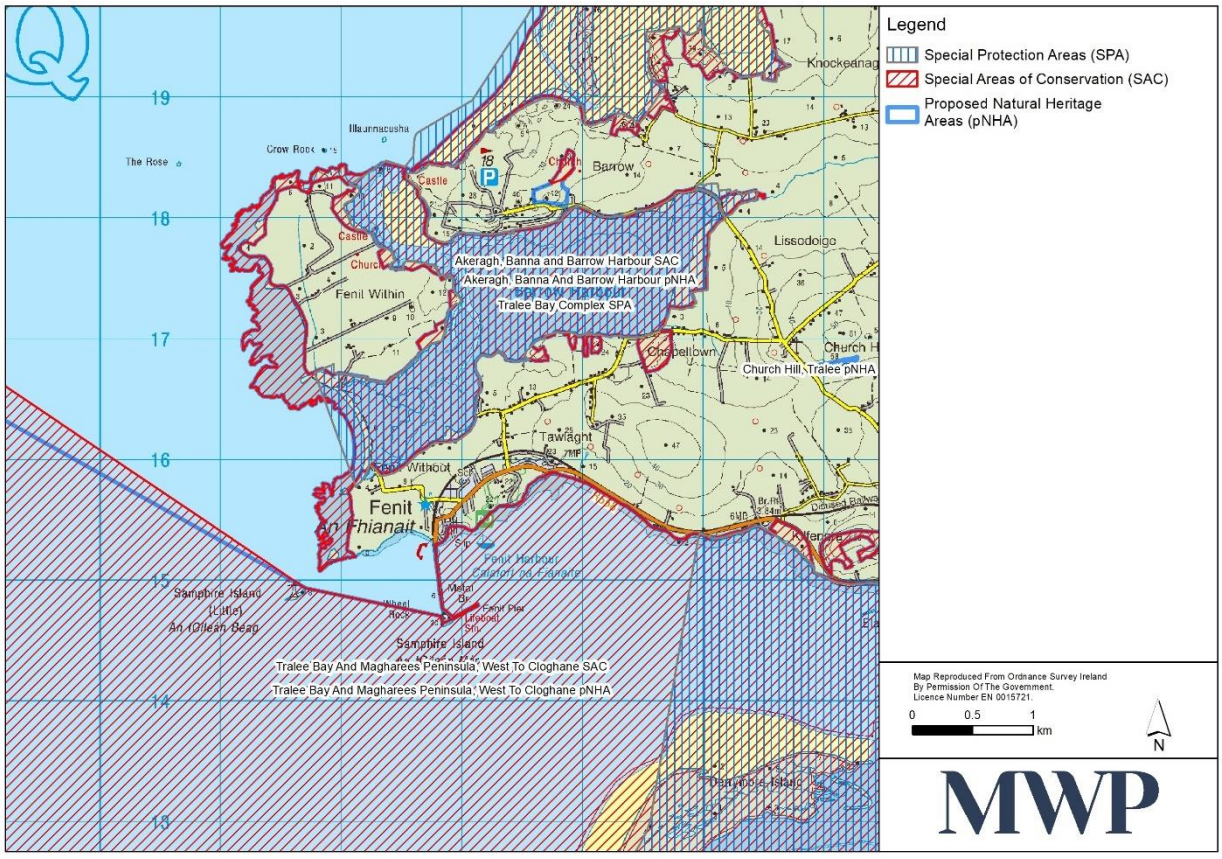


Figure 1. International (SACs and SPA) and national (pNHA) protected areas for habitats and wildlife near Fenit

Tralee Bay east of Fenit Harbour is also designated as Shellfish Waters under European legislation to protect or improve waters to support shellfish life and growth. Four species of shellfish are fished within Tralee Bay: brown crab, lobster, spider crab and native flat oyster.

The National Biodiversity Action Plan 2017-2021 published by the Department of Culture, Heritage and the Gaeltacht, outlines the vision for Ireland's biodiversity and ecosystems with the aim of halting biodiversity loss and degradation of ecosystems. It includes objectives to conserve and restore biodiversity, strengthen knowledge and governance, among others. An Interim report published in February 2020 showed that limited progress had been achieved in actions to stop the decline of biodiversity in Ireland. A common example of biodiversity loss in the Irish countryside in recent years is the trend for clearance of scrubby fields dominated by bushes and shrubs such as willow and hawthorn as well as grasses and wildflowers, often in old fields abandoned for agriculture. Scrub habitats are important in themselves as habitat for a diverse range of plants, insects and bird species. Scrub is also a precursor to broadleaved woodland habitat development providing just the right conditions for young trees to get a footing.

The Environmental Protection Agency (EPA) produces a state of the environment report on a four-yearly cycle providing information and knowledge in support of actions to protect and manage the environment. One of the key messages of the EPA in the most recent state of the environment report, which they published in 2020[2], about Nature is:

"*Nature and wild places are at risk in Ireland and need to be better safeguarded, both locally and in protected areas. The next Biodiversity Action Plan needs to be more ambitious and identify the pathway to transformative change for nature protection in Ireland. It needs to develop and further strengthen the protection of our national network of protected areas for future generations and to reverse wider current trends in biodiversity and habitat loss*."

The aim of this biodiversity action plan for Fenit is aligned to this aim to safeguard the nature and wild places in Fenit. The first step to achieve this is to identify those places in the plan so they can be protected and maintained while the next step is to identify areas where biodiversity can be improved and more wildlife habitat can be created. While protected areas like SACs and SPAs get a lot of attention, local wildlife can often be overlooked, and this is where local biodiversity action plans can play a really important collective role in minding and caring for our local biodiversity.

1.5 WHAT IS A LOCAL BIODIVERSITY ACTION PLAN?

While there are areas in Ireland that are protected by the Habitats and Birds Directives including Tralee Bay and Barrow Harbour mentioned earlier, much of the countryside has limited protection. The waters around Fenit are all within protected areas for nature conservation, however, the village of Fenit and surrounding land has limited legal protection though it is illegal to cut hedges between March and August, inclusive, and it is illegal to disturb the resting or breeding place of badgers, bats, hedgehog, otter, among others. Wild birds and their nests and eggs are also protected.

In Fenit, several biodiversity related initiatives exist such as the Wild Mind festival in the springtime, which celebrates the natural environment and raises public awareness through giving people an

[2] https://www.epa.ie/publications/monitoring--assessment/assessment/state-of-the-environment/Ireland's-Environment-An-Integrated-Assessment-2020-Key-Messages-Booklet.pdf

opportunity to engage with the environment by hosting a range of events including wildlife films, talks, workshops and activities. Fenit has also established a dune protection scheme to protect the sand spit that connects to Fenit island, which is narrow and subject to the erosional forces of the sea. This has been undertaken by the local development group, Fenit Town Hall. Biodiversity walks for the public are also hosted by the local community. A residents or local volunteer group called Changing Tides Fenit Group set up to improve their housing estate, Atlantic Homes, and are currently working on a wildflower pollinator project[3] in a green area in the estate. The Celtic Mist, which is now operated by the Irish Whale and Dolphin Group and used to train its members to survey and record whales, dolphins and porpoises, spent time moored in Fenit this summer 2021.

Figure 2. Wild Mind Festival booklet 2019

[3]https://www.visitfenit.ie/2021/10/29/fenits-changing-tides-pollinator-project/?utm_source=rss&utm_medium=rss&utm_campaign=fenits-changing-tides-pollinator-project

Figure 3. Photograph of dune restoration scheme signage

A local biodiversity action plan provides a mechanism to protect areas of local biodiversity importance. It identifies areas that are currently of value as habitat for wildlife and areas that currently are out? but where action could be taken to create habitat for local wildlife. The plan should work together with these local initiatives.

1.6 AIMS OF THE PLAN

The aims of the Fenit Biodiversity Action Plan are to:

- Identify areas of local biodiversity importance
- Gather and collate information on the local biodiversity
- Conserve, maintain and enhance local biodiversity
- Increase community awareness of biodiversity
- Assist in sustainable development of the local area
- Provide a basis for future biodiversity projects and funding

2 APPROACH

2.1 SPACE FOR WILDLIFE

Before starting, it is important to establish what is already in Fenit in terms of wildlife and biodiversity and whether something new needs to be created or is there an existing habitat which just needs to be maintained. Allowing a site to develop naturally can often be better (and cheaper to achieve). Habitats also need some level of maintenance whether it be mowing or planting new woodland which requires removal of competing vegetation to properly establish. Certain habitats have specific

environmental requirements, so it is important that any proposals are suitable for the available climate and environmental conditions[4].

It is also important to establish the type and area of available public spaces. In Fenit, most of the spaces are private residences and farming lands while public spaces are fewer and include the playground, the greenway, coastline, the park between Castleview housing estate and St. Brendan's National School. Therefore, any biodiversity actions outside of public spaces will need to be carried out, or permitted, by the landowner.

It is also important that habitats are not created in areas that are already of biodiversity value e.g. removing scrub or wildflower meadow to plant woodland.

2.2 CONSULTATION

A number of meetings were had with the Fenit Development Association on the aims and approach to the Biodiversity Action Plan. The draft plan will be put out for consultation with the local community. Given the restrictions associated with covid-19, consultation with the local community will be conducted on-line.

2.3 DESK-TOP STUDY

The following publications were consulted during the preparation of this plan:

- Available online satellite imagery, aerial photography and mapping (sources: OSI, Google, Bing)
- Available online National Parks and Wildlife Service (NPWS) mapping, data and publications (www.npws.ie)
- Available online Environmental Protection Agency mapping and data (www.epa.ie)
- BirdWatch Ireland (BWI) (birdwatchireland.ie)
- British Trust for Ornithology (BTO) (https://www.bto.org/)
- Bat Conservation Ireland (www.batconservationireland.org)
- Royal Society for the Protection of Birds (RSPB) (https://www.rspb.org.uk/)
- Vincent Wildlife Trust Ireland (https://www.vincentwildlife.ie/)
- Irish Wildlife Trust (IWT) (https://iwt.ie/)
- The Wildlife Trust (https://www.wildlifetrusts.org/)
- All-Ireland Pollinator Plan 2021-2025 (https://pollinators.ie/wp-content/uploads/2021/03/All-Ireland-Pollinator-Plan-2021-2025-WEB.pdf)
- The Tree Council of Ireland (www.treecouncil.ie)
- Geological Survey of Ireland (GSI) (https://www.gsi.ie/en-ie/Pages/default.aspx)
- Habitat management for bats: a guide for land managers, land owners and their advisors. JNCC (2001).
- Making a wildflower meadow: the definitive guide to grassland gardening. Pam Lewis (2003)
- Other sources of information are footnoted in the plan

[4] https://www.lrwt.org.uk/sites/default/files/2020-01/space_for_wildife_2010-2015__habitat_creation_.pdf

2.4 ECOLOGICAL SURVEYS

A number of ecological walkover surveys were completed to gather information on the local ecology. A photographic record of the surveys is presented in **Appendix 1**.

A habitat survey was carried out within the village and surrounds where habitats were documented and lists of species documented in accessible areas. It's worth noting that much of the land within the village are associated with private ownership. A habitat map was produced and habitats are summarised below in **Section 3.3**.

Three bird survey transects were undertaken in April, June and October 2021. The surveys took in the viaduct, pier, marina, main road through the village, the local road heading north opposite the gates to Fenit House, the road north of there between the junction and the shore, the southern shoreline of Barrow Harbour to the sand spit and from here back along the coast to the diving boards and back into the village. The results of the bird survey are presented in **Appendix 2** and summarised in **Section 3.6** below. The bird species recorded isn't exhaustive and is a record of species observed or heard during the transect walk on that day.

A bat activity survey was undertaken using two automated static detectors deployed over 12 nights in July 2021, which pick up on the high frequency calls (echolocation) emitted by bats to navigate the landscape and detect insect prey. Each bat species emits a unique sound, which allows the detectors to identify that species of bat. One detector was located along a vegetated part of the Tralee-Fenit Greenway and a second was in an area of woodland east of The Paddocks housing development as shown in **Figure 4**. Automated bat detectors measure the number of bat passes per night per species. The results of the bat survey are presented in **Section 3.5** below.

Figure 4. Purple dots showing locations of bat static detectors

2.5 DATABASE

A database has been created to gather and collate all documents used in this plan relating to the biodiversity of Fenit and the surrounding area. It is not practical to present all this data here and so

the information relating to the local ecology has been summarised below in **Section 3**. This database should be live and can be added to as further information is gathered.

3 BIODIVERSITY IN FENIT

3.1 MARINE LIFE

Fenit is surrounded on three sides by the seawaters and associated sea life. The old OSI 6-inch mapping completed between 1829 and 1841 illustrate the lack of any sort of housing or other structures where Fenit village is currently situated today. Fenit Lodge and a small settlement on the shore of Barrow Harbour were the only residences in the area at that time so the village of Fenit has built up around the activities of the Port over the last 150 years or so and is thus culturally very strongly connected to the sea.

Every number of years the port is dredged to clear siltation so ships and boats can navigate the port safely, and seabed surveys are completed to inform the work. Samples taken from the seabed undertaken as part of a previous seabed flora and fauna survey recorded the presence of polychaetes (segmented worms), crustaceans (crabs, shrimps, prawns), molluscs (mussels, cockles, snails etc.), oligochaetes (sludge worms), cnidarians (jellyfish, corals), chelicerata (sea spiders), nematodes (round worm), nemerteans (ribbon worms), sipunculan (unsegmented worm), tunicates (sea squirt) as well as fish species.

Wheel rock consists of a jagged rocky area that is uncovered at mid-tide and is located approximately 250m west of the harbour. According to a previous dredging report the top of the rock was bare apart from a sparse cover of mussels and barnacles. The base of the rock was covered by a light layer of sediment with red and brown algae attached. Sponges and anemones were also attached to the rock.

Whales, dolphins, porpoises and seals have all been recorded in Tralee Bay. Pilot whales have been recorded in the bay, sometimes stranding. Bottlenose dophin have been regularly recorded while grey seal breeding areas occur across the water at the Maharee islands.

Students at Munster Technological University (MTU) have undertaken several shore and marine survey projects and a list of these is included in the database.

The fascinating marine life around Fenit provides a great opportunity for increasing community awareness of the rich wildlife that exists close by.

3.2 LOCAL SETTING

The village of Fenit is located on the north side of Tralee Bay about 10km west of Tralee town in north County Kerry. It is located at the end of a headland that is connected through a narrow sand spit or tombolo to Fenit Island to the north. Barrow Harbour, a natural shallow tidal inlet, which is exposed at low tide lies to the north while Tralee Bay is situated to the south. It lies within the townland of Fenit Without and is bordered by Tawlaght to the east. Fenit and surrounds including Fenit Island are underlain by limestones like parts of north and central County Kerry. The soil in Fenit is characterised as limestone till.

The landscape is dominated by the Slieve Mish Mountains to the south and Fenit has unparalleled views of this range and the bay. The village is contained by the sea to the south and to the west as far as the Maheree islands, to the north by low lying rural farmland and to the east by a coastal landscape.

Figure 5. Map of Fenit (source: OSI)

Fenit Harbour lies immediately south of the village and sits at the north side of the entrance to Tralee Bay. The harbour was built in 1880 and connected to Samphire Island by a viaduct over 500m long. A further breakwater runs east-northeast from the Island. Fenit village historically grew around a busy commercial harbour working in tandem with a local fishing fleet. Over the decades the significance of the fishing and commercial activities in the harbour have declined. In its place a mixed-use harbour facility has developed, which includes commercial shipping for Liebherr Cranes, a small number of inshore fishing boats, tourism related activities, water sports, RNLI Rescue base and a well-established marina.

An 11km greenway along the former railway line that ran between Fenit village and Tralee town is currently being developed and due to open in 2022.

Figure 6. Aerial image of Fenit (source: OSI)

Figure 7. Places and areas of interest in the village and surrounds

3.3 HABITATS

3.3.1 Overview

Habitats are places where a plant or animal naturally makes its home and is the natural environment of that species. Given its coastal location Fenit supports a variety of interesting wildlife rich habitats. The following paragraphs describe the habitats that are found at Fenit. A habitat map has been prepared and is presented below. A photographic record of habitats and areas of interest in Fenit with some descriptive text is presented in **Appendix 1**.

Figure 8. Habitat map of Fenit

3.3.2 The Coast

The shoreline around Fenit is relatively exposed to the weather elements especially the wind bringing with it strong waves. Sandy shores occur to the south of Fenit, rocky shores to the south and west, a shingle and cobble shore west of the sand spit, and a large expanse of sandflats and mudflats to the north in the sheltered Barrow Harbour. Sections of rock armour are located adjacent to the pier structures. The rocky shores display a great variety of animals and plants including a variety of seaweeds and lichens, crustaceans such as crabs, molluscs (snails) and sea anemones, among others. The sheltered muds at Barrow Harbour support a rich community of marine worms and snails that live in the rich muds and support waterbirds that arrive in winter. Small areas of fringing salt marsh, which is a tidal marsh and another coastal ecosystem which like sand dunes offer protection against coastal erosion, occur along the shore at Barrow Harbour and host a variety of specialised flora and fauna.

Figure 9. View of diverse range of seaweeds on the shore (left) and sea snails and anemones in a rocky pool

Needle like fescue grasses dominate along the coastal grassy cliffs to the south with wildflowers like sea thrift, sea campion, bird's-foot-trefoil and ribwort plantain. These areas are also of biodiversity importance for their grasses, wildflowers and associated insect and bird life.

Figure 10. Grassy cliffs beside St. Brendan's statue on Samphire Island and southern shoreline east of slipway

Another coastal area of interest is a small grassy area adjacent to the slipway east of the Sailing Club where there are a variety of grasses and wildflowers including tree mallow, ribwort plan, ragwort, clovers, wild carrot, herb Robert and more. To the rear of this is an area of scrub with fuchsia, bramble and ivy, all important plants for our insects and birds. Closer to the shore sea beet, orache, silverweed and rock samphire occur.

Figure 11. View of grassy wildflower meadow and wild carrot beside the slipway

3.3.3 The Village

While it's acknowledged that the surrounding coastal and marine areas are of international importance for their wildlife and habitats, the most important elements of the village and onshore surrounds include the hedgerows intersecting the agricultural fields, areas of scrub, small parcels of woodland and the gardens and meadows associated with properties. The village has both old and new buildings along with gardens and meadows that can also support wildlife. Buildings and especially old buildings can provide opportunities for roosting bats.

A wide range of plants can be found in the village along hedgerows and old stone wall boundaries as well as gardens. The hedging bounding properties in Fenit comprises a mix of non-native and native shrubs and trees. Non-native trees include escallonia and hebe. While pollinators do use these shrubs it is always better to choose native plants over non-native when planting for wildlife as they support a greater variety of organisms. Old stone walls support some interesting assemblages of lichens, mosses and wildflowers such as biting stonecrop, rock samphire, ivy leaved toadflax, herb Robert and creeping thyme.

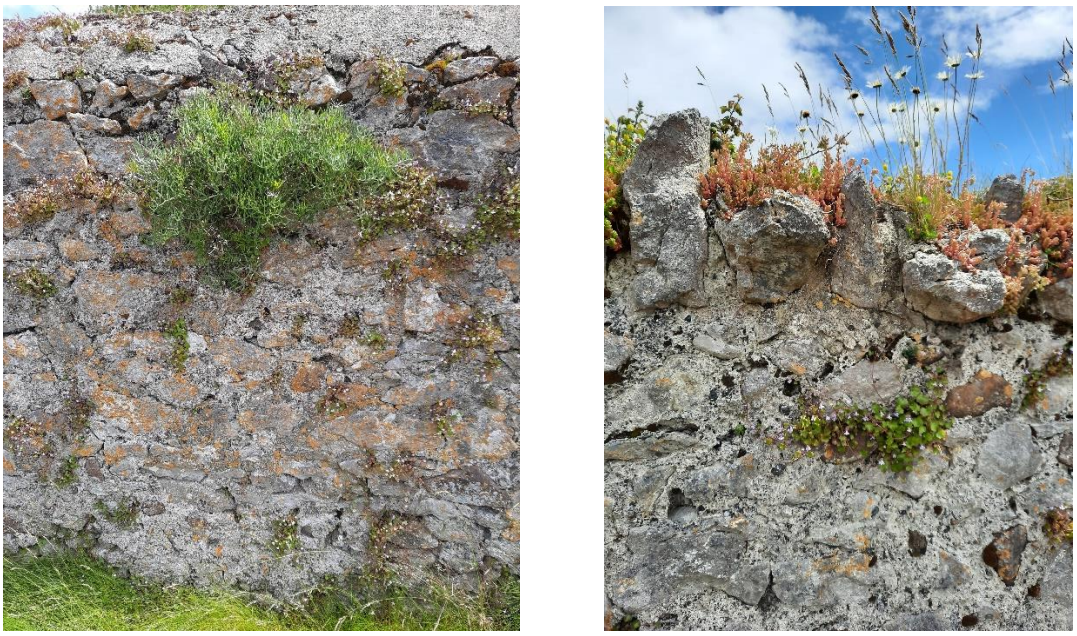


Figure 12. Examples of biodiverse stone walls

Tralee Bay Sailing Club did not mow their lawn in 2021 and as a result a diverse and interesting wildflower meadow grew that included native clovers, kidneyvetch, wild carrot, oxeye daisy, speedwell, dandelions, hawksbeard, yarrow and a variety of grasses. Bee orchids, lady's bedstraw and eyebright were recorded beside the carpark where short coastal grasses and wildflowers had colonised an area of gravel.

Figure 13. Bee orchids and wildflower meadow at the Sailing Club

The village and surrounding lands lie on a relatively exposed headland with less shelter than inland areas and it is more difficult for woodland and trees to prosper. Woodland occurs mainly in private lands and gardens. The largest area of mature woodland is at Fenit House where strips of pine trees are planted, among other species. Some scrub also occurs at Fenit House along with a large expanse of lawn, which has great potential to host a wildflower meadow. Scrub is a natural precursor of native woodland providing the shelter required for trees to grow.

Evidence of ash dieback disease was apparent among some of the ash trees growing in the village. This disease was first detected in 2012 in imported trees and now the disease is prevalent throughout most of Ireland and is likely to cause the death of most ash trees over the next two decades[5].

There are several housing estates, Marian Terrace, Lighthouse Village, Atlantic Homes, The Paddocks and Castleview with shared green spaces or mowed lawn. Castleview has some nice mature broadleaved treelines. Many of the gardens throughout the village have planted trees and shrubs some of which are likely to be native. However, most of the green spaces/mowed lawns in the village lie within private gardens, which have great potential to increase the biodiversity of the village. Each garden can contribute individually to biodiversity improvements by, for instance, erecting bird boxes and giving some lawn over to wildflowers, and as a collective increase habitat for wildlife and make a measurable difference. A mown lawn is a relatively impoverished wildlife habitat however, replacing some or all the lawn with an area subject to a less frequent mowing regime or planting native trees and shrubs will greatly increase its value for bugs and birds, and doing this as a collective will increase the wildlife value of the village as a whole.

There are a number of invasive plant species in the village including old man's beard, evident in scrub near the old railway footbridge and along the greenway. Invasive species can outcompete and push out native species. Montbretia, an invasive perennial plant, was also evident around Fenit. It can arrive following disturbance along a hedgerow and can quickly establish and dominate, outcompeting native flora.

[5]https://www.teagasc.ie/crops/forestry/advice/forest-protection/ash-dieback/#:~:text=Ash%20dieback%20was%20first%20detected,over%20the%20next%20two%20decades.

Some evidence of escapees from wildflower seed mixes typically sold in garden centres were evident along grassy verges in the village and the greenway. The All-Ireland Pollinator Plan advises against purchasing and sowing these mixes as the genetic origin may not be local or Irish and are often not good for biodiversity. The insect and bug life that naturally occur in Fenit are all naturally adapted to our existing wild plants so native species are best.

The lands that extend away from the village to the west, north and east mainly comprise improved agricultural fields with interconnecting hedgerows or stonewalls. A very ecological diverse and interesting area of land lies northwest of the village beside Fenit Samphires Football Club (FC). Immediately west of the main pitch lies an old field that is narrow and long with an overgrown hedgerow, which has been historically farmed but since abandoned and supports a diverse range of plant and bird life.

Figure 14. View of style into' old field' beside soccer pitch and view in winter

The area beyond this to the north and west was also farmed in the past but since abandoned and has been colonised by scrub including bramble and is considered a valuable refuge for wild plants, small mammals and birds. The fields west and north of the football club are considered valuable refuges for locally important wildlife in an otherwise intense agricultural or urban/village setting.

Figure 15. View of scrubland to the north and west of Fenit Samphires FC

3.3.4 Tralee-Fenit Greenway

The greenway was originally the site of an old railway and is currently being developed as a greenway by Kerry County Council. The sheltered embankments and exposed limestone rock faces provide excellent refuges for wildlife and act as an ecological corridor between the village and the surrounding landscape providing commuting routes and feeding areas for bugs, birds and bats. A great variety of native plants were evident along the greenway verges including harts tongue fern, bramble, willowherb, oxeye daisy, spear thistle, sow thistle, prickly sow thistle, tufted vetch, germander speedwell, figwort, smooth hawk's-beard, among others.

Figure 16. Wildflowers, ferns and native grasses abundant along the greenway verges

3.4 MAMMALS

Otter, fox and badger are known to occur in the landscape around Fenit. Otter occur along the coast, are protected under European and Irish law and are listed as one of the reasons for the designation of Tralee Bay as a Special Area of Conservation (SAC).

Small mammals include pygmy shrew and wood mouse. Both species are found in woodland, hedgerows, and grasslands. Pygmy shrews have such a high metabolism that they need to eat day and night and feed on beetles, woodlice, spiders. Wood mice rely on seed and plant material. Pygmy shrew has declined in numbers in recent years and is considered locally extinct in areas. Similarly, wood mice numbers are considered to be in decline. These species are an important part of our ecosystems and provide food for fox and badger as well as birds of prey including kestrel and buzzard, both known to occur at Fenit. A local biodiversity action plan like this one provides a great opportunity to provide shelter and food sources for small mammals.

3.5 BATS

The places that bats (also mammals) live in are called roosts which could be trees, caves, and buildings. Bats need different roosting conditions at different times of the year and in winter bats need hibernation roosts. In summer bats need maternity or nursery roosts where pregnant females gather to have their pups. Mother bats have one baby and suckles it with her own milk for several weeks. In

a single night a bat can eat three thousand small insects including midges, tiny moths and beetles and these food sources can be found in our native woodlands, scrub, meadows, and hedgerows.

In Fenit there are many buildings and structures, old and new, where bats could roost. Bats can roost in attic space, behind soffit boards, under tiles, in wall cracks in old buildings and in masonry bridges. There are several old roofed buildings around Fenit village that could be investigated further for the presence of bat roosts; photographs of some are included in **Appendix 1**.

In the landscape, bats feed on flying insects along hedgerows, woodland, scrub and gardens. Woodland provides good shelter and a variety of insect life for bats. In the agricultural landscape around Fenit village, the continuous hedgerow provides insect prey and connectivity for bats travelling between feeding sites. For example, Brown long-eared bats rarely cross open areas and follow hedgerows, tree lines and grassy banks when moving between roosts and feeding sites. The heavily managed agricultural fields provide relatively less food for bats though fields that have reverted to meadow or scrub provide good sources of insect prey for bats.

A bat activity survey was undertaken using two automated static detectors in July 2021 with one located along the greenway and a second in an area of woodland east of The Paddocks. Automated bat detectors measure the number of bat passes per night per species. Bat passes were recorded at both sites. There are nine species of bats in Ireland. Most of the bat activity along the greenway comprised of common pipistrelle bats with relatively lesser frequency of leisler's and soprano pipistrelles. Similarly, at the woodland site common pipistrelle were the most frequently recorded bat species, however activity for this species here was over twice that recorded along the greenway for the same period. More soprano pipistrelles were also recorded at the woodland site though relatively less leisler's were recorded. Brown long-eared bat was recorded at the woodland site and not recorded on the greenway. Four species of bats were recorded in Fenit demonstrating the importance of the village for bats.

3.6 BIRDS

Fenit is probably best known for its wintering bird population. Inner Tralee Bay and Barrow Harbour including the sand spit at Fenit Island is protected under the Birds Directive as a Special Protection Area (SPA) for birds that feed at Barrow Harbour on marine worms and snails that live in the rich muds. The harbour provides winter quarters for birds which breed in Arctic Canada, Iceland and Northern Europe and for passage migrants that stop off to feed on route to somewhere else. Whimbrel for example, which look like Curlew, stop off at Barrow in late spring returning from wintering grounds in Africa to breed in Siberia, Canada and Northern Europe. Eel grass growing on the muds is an important food source for the Brent Geese that visit these shores each winter from high-arctic Canada. Barrow Harbour and Tralee Bay are surveyed monthly during winter as part of the Irish Wetland Bird Survey (I-WeBS). During the preparation for the plan, bird survey data collected as part of the survey was requested and will form part of the database.

Figure 17. Whimbrel (source: BirdWatch Ireland)

Two breeding bird surveys were carried out in summer 2021 and a wintering bird survey in October 2021 in the village, along local roads and along the coast. All birds that were seen and heard on the day were recorded and a full list of these are presented in **Appendix 1** of this plan. Other bird species also occur but were not seen or heard on the survey days.

Common breeding bird species included blackbird, blue tit, chaffinch, house sparrow, robin, swallow, house martin, wren and many more. Dunnock was recorded in scrub habitat while a single Buzzard was recorded at the shore. Rock pipit was recorded by St. Brendan's statue. Whimbrel was also recorded in late April feeding on the coast.

Wintering birds recorded along the coast in October included whooper swan flying over the harbour, brent geese feeding on eel grass, dunlin and sanderling feeding on worms and snails on the mudflats, linnets and goldfinches feeding on seeds of shoreline plants, gannets flying over the sea and a wheatear flying from its breeding grounds in Canada to its wintering grounds in southern Africa stopped off at Fenit along the way.

Figure 18. Brent goose and linnet (source: BirdWatch Ireland)

3.7 INSECT LIFE

Insects are the most diverse and numerous group of animals on earth. About 11,500 different insect species have been discovered in Ireland and is estimated that there are actually much more[6]. Insects have three pairs of legs so technically speaking spiders and woodlice are not insects, however, for the purposes here insect, or bug, life refers to all land based invertebrate life. Insects pollinate about 80% of crops in Europe and provide essential food sources for birds and bats. It is estimated that insects have declined by 75% over the past 50 years. Any improvement in plant biodiversity will in turn create more habitat for insect life and in turn birds and bats.

4 FENIT'S BIODIVERSITY ACTION PLAN

4.1 FENIT VILLAGE

The village is really the main focus of the plan as that is where most of the community reside. Within the village there are private and public spaces where there is great potential to conserve and increase biodiversity.

4.2 PRIVATE GARDENS AND PUBLIC SPACES

Grassland meadows that are rich in plant species are the most threatened habitats in Ireland[7]. The acreage of private gardens in Fenit village is greater than the area of onshore public space. Thus, people's gardens can play an important role in saving our biodiversity by providing refuge and food for dwindling populations of birds, butterflies and bees. The Byrne residence on the eastern side of the village has an impressive area of amenity grassland or lawn surrounded by pockets of woodland. The amenity grassland surrounding Tralee Bay Sailing Club was left unmown in 2021 until late in the summer and as a result boasted an impressive variety of wildflowers.

One of the objectives of the All-Ireland Pollinator Plan 2021-2025 is to increase the number of gardens that are pollinator friendly, as well as Sports Clubs. The best thing about the All-Ireland Pollinator Plan is that by maintaining or creating habitat for pollinators we are also creating habitat for lots of other wildlife including bugs, mammals and birds. It's simply a win-win for wildlife!

What we often consider as weeds are actually native wildflowers. Some plants that we think of as weeds such as dandelions, brambles, ivy, clovers, nettles provide important food sources for pollinators. Irelands wild bees are in decline because they go hungry because of a lack of food in the landscape and thus it is important that pollinators have food to sustain them throughout the spring, summer, and autumn. Dandelions are important pollen and nectar sources for bees and their peak flowering time is from late March to May when many bees and pollinators emerge from hibernation while goldfinches and house sparrows eat the seed. Bramble or the blackberry bush, which flowers from June provides nectar for bees and nesting opportunities for solitary bees and small birds and provides berries for birds in autumn. Ivy, which flowers between early September and early November, is probably the most important flowering plant for pollinators in autumn months while its berries, which ripen in winter, are a valuable food source for blackbirds and thrushes.

One of the aims of the All-Ireland Pollinator Plan is to increase the area of public land that is pollinator friendly. Objectives around this include making transport corridors (e.g. road and greenway edges)

[6] https://www.museum.ie/en-IE/Collections-Research/Natural-History-Collections/Collections-List/Insects
[7] https://pollinators.ie/the-importance-of-species-rich-meadows-and-grasslands-even-mini-ones/

and schools more pollinator friendly. Public spaces at Fenit include the playground, the greenway, coastline, and the park between Castleview housing estate and St. Brendan's National School.

4.3 THE COAST

The coastline includes the intertidal area that is exposed at low tide and inundated at high tide and is considered an extreme ecosystem where organisms must be able to survive changes in moisture, temperature, salinity and withstand strong waves[8]. The intertidal zone is important for a range of wildlife where a multitude of organisms occur on the sandflats and mudflats of Barrow Harbour and the rocky and sandy shores to the west and south. Rocky shores in particular display vertical zonation where the different ecology communities occur up the shore where some species live up at the high tide mark and others at the low tide mark. To the west of Fenit there is an extensive area of rocky shore with tidal pools, holes, cracks and crevices where a variety of organisms are found including different types of seaweed, mussels, barnacles, limpets, crabs, sea anemones, starfish, fish, among others. The coastline at Fenit offers great opportunities for community education and an appreciation of biodiversity.

4.4 THE HINTERLAND

The hinterland, or landscape, around Fenit is considered the land that extends away from the village and housing developments. For the most part it consists of agricultural fields, hedgerow and scrub. Both hedgerow and scrub are considered very valuable local habitat for wildflowers, insect life, birds and mammals. These habitats act as refuge for these species in an otherwise impoverished agricultural landscape. Hedgerow habitat in particular provides ecological corridors between the village and the surrounding landscape providing commuting routes and feeding areas for bats and mammals. There is some very valuable scrub habitat in this area, which provides an oasis for native flora and fauna, and which should be conserved into the future.

[8] https://www.nationalgeographic.org/encyclopedia/intertidal-zone/

4.5 DETAILED ACTIONS FOR BIODIVERSITY IN FENIT

The following table sets out the detailed actions for biodiversity maintenance and improvement in the village and surrounding landscape.

Action	Reason	Location	Method	Appendix/Resource
Develop a nature trail along existing access routes	Encourage community engagement with biodiversity and increase knowledge and awareness of biodiversity	Village, greenway and along the coast	· Develop a nature trail using existing access routes and roads · A nature trail loop could be developed starting at the beach carpark and walking a clockwise direction along the coastal path taking in the rocky shore, sand dunes, hedgerows along the local road before arriving back into the village · The same trail or a separate trail could take in the village and greenway	
Organise nature events for children		Rocky coast and greenway	· Organise a nature walk scavenger hunt	*Scavenger hunt worksheets* available online such as www.twinkl.ie
Conduct more guided biodiversity walks, community events and wildlife information sharing exercises		Rocky coast, greenway and other areas of interest in Fenit	· Connect with local and national universities and invite marine biologists from MTU, UCC or NUIGalway to conduct walks along the rocky coast. · Organise a rocky shore nature walk for children and adults · Connect with the Irish Wildlife Trust in relation to Citizen Science projects and providing community group training in relation to biodiversity monitoring training · Invite local birders to give guided walks to adults and children along the shoreline in winter months to watch all the wintering birds	*Irish Wildlife Trust* https://iwt.ie/ *Bat Conservation Ireland* (BCIreland): *how to watch bats* https://www.batconservationireland.org/in-your-area/watching-bats *Bat Conservation Ireland: bat sightings*

Action	Reason	Location	Method	Appendix/Resource
			· Organise a night-time bat walk along the greenway and record any sightings on BCIreland website · Connect with MTU staff and students who carry out undergraduate ecology projects in Fenit	https://www.batconservationireland.org/in-your-area/sightings
Increase food supply for bats	Improve habitat for bats	Private gardens and public spaces	· Retain hedgerow, woodland/groups of trees and scrubby areas for bats · Plant native broadleaved trees and shrubs · Grow flowers especially night-scented ones that attract moths and other night-flying insects · Let an area of the garden grow wild · Create garden ponds · Avoid use of pesticide	*Appendix 3*: Creating garden ponds for wildlife
Erect bat boxes on tree trunks of building walls	Maintain and increase local bat populations. Increase community awareness of bats.	· In private and public spaces with suitable trees · Underside of bridges along greenway	· Bat boxes are artificial roosts designed to encourage bats into areas · Bat boxes are most likely to be used if they are located where bats are known to feed · Boxes can be made from wood by or purchased ready made · Boxes should be 4m above the ground, away from artificial light sources, sheltered from strong winds and exposed to the sun for part of the day	*Appendix 4*: Bat box information pack *Bat Conservation Ireland* https://www.batconservationireland.org/ *Vincent Wildlife Trust Ireland* https://www.vincentwildlife.ie/
Bat roost surveys	Identify potential bat roost locations to ensure their protection	· Private and public buildings	· Bat roost surveys must be carried out by a suitably qualified ecologist and may require a licenced ecologist	*Report any roost findings to Bat Conservation Ireland* https://www.batconservationireland.org

Action	Reason	Location	Method	Appendix/Resource
			· Enter bat sightings on Bat Conservation Ireland website	
Erect nest boxes	Maintain and increase local bird populations. Increase community awareness of birds	· In private and public spaces with suitable trees · Underside of bridges along greenway, on trees	· Boxes can be made from wood by or purchased ready made · Boxes should be erected on east facing sheltered spots · BirdWatch Ireland provide information on how to build and where to put a nestbox · British Trust for Ornithology (BTO) also provide details on nest box construction	*Appendix 5*: BirdWatch Ireland Nest box factsheet *Appendix 6:* BTO Nest boxes - your essential guide
Erect bird feeders	Maintain and increase local bird populations. Increase community awareness of different bird species	Private gardens and public spaces where people can view them	· Bird feeders can be made or purchased with different bird feeders and feed suiting different species · Clean regularly to prevent diseases · BirdWatch Ireland and Ireland's Wildlife websites provide tips on getting the best from your bird feeders	*BirdWatch Ireland guidance* https://birdwatchireland.ie/irelands-birds-birdwatch-ireland/garden-birds/feeding-your-garden-birds/ *Ireland's Wildlife guidance* https://irelandswildlife.com/9-tips-feeding-garden-birds/
Hedgehog	For the community and local children to learn more about hedgehogs	Suitable private gardens and agricultural fields, public spaces	· Take part in the Irish Hedgehog Survey, a Citizen Science project based in NUI Galway · Conduct a Local Area Hedgehog Survey within 1km square areas with footprint tunnels · Conduct Garden Hedgehog Survey with a footprint tunnel or trail camera	*Irish Hedgehog Survey* https://www.irishhedgehogsurvey.com/

Action	Reason	Location	Method	Appendix/Resource
Maintain existing wildlife corridors in the village and wider landscape	Continue providing refuge and shelter for plants and animals	Private and public spaces	· Maintain and protect linear features such as flowering hedgerows, lines of trees, old stone walls all of which act as wildlife corridors for insect life, bats, small mammals and birds	*Appendix 7*: Local community actions to help pollinators *All Ireland Pollinator Plan* https://pollinators.ie/aipp-2021-2025/
Leave field margins grow wild along field edges to create wildlife strips	Provides ecological corridors, refuge for wild plants, which in turn attract pollinators, bats, small mammals, and birds e.g. seed eating species	Private lands – edges of agricultural fields	· Fence (where grazing stock kept) and leave a minimum of 1.5m between the field boundary and main field to allow wild plants to flourish · Do not spray the wildlife strip or sow any wildflower mixes	*Teagasc* https://www.teagasc.ie/news--events/daily/environment/managing-margins-with-nature-in-mind.php
Create wildflower meadows	To increase insect life including pollinators and provide food sources for bats and birds	· Private and public gardens and lawns · Public spaces like the Tralee-Fenit Greenway	· Wildflowers need nutrient poor soils conditions to thrive and changing the grass mowing regime can reduce the nutrients soil · The All-Ireland Pollinator Plan advises against planting wildflower seed and supports reduced mowing instead to allow our native wildflowers to grow[9]. Wildflower seed mixes often contain non-native plants or native species that have been sourced abroad. If sowing seed collect seeds from nearby wildflowers in autumn and sow in spring on bare ground or in pots.	*Appendix 8*: Garden action to help pollinators *Appendix 11*: Public wildflower meadow project examples *All Ireland Pollinator Plan* https://pollinators.ie/aipp-2021-2025/

[9] https://pollinators.ie/wildflower-seed/expert-opinions/

Action	Reason	Location	Method	Appendix/Resource
			· Two examples of potential wildflower meadow projects in public areas include a recently gravelled area near the Liebherr building at the pier and a mown lawn north of the playground details of which are included in Appendix 11	
Change grass mowing regime to favour wildflowers	To increase insect life including pollinators and provide food sources for bats and birds	· Private gardens and lawns including the Tralee Bay Sailing Club and Byrne residence · Public spaces including roadside verges · St. Brendan's N.S. · Tralee-Fenit Greenway	· Set aside an area or strip of garden for wildflowers · Reduce the frequency of mowing of grassy areas · Ideally, mow in September, however, if the area or strip is dominated by tough grasses, mow sooner in July, which will help reduce nutrients in the soil. · Always remove the cuttings to ensure the decomposing debris does not smother the wildflowers or re-fertilise the ground · Wildflowers need nutrient poor soils conditions to thrive so over the years as the cuttings are removed the garden will become richer in wildflowers	*Appendix 8*: Garden action to help pollinators *All Ireland Pollinator Plan* https://pollinators.ie/aipp-2021-2025/
Create pollinator friendly spaces	Increase food supply in gardens for pollinators	· Private gardens and public spaces including St. Brendan's N.S., Tralee Bay Sailing Club · Tralee-Fenit Greenway	· Pledge your garden for pollinators · Don't cut grass until after mid-April after the Dandelions have flowered. · Plant native flowering hedgerows surrounding property · Plant bee friendly garden plants that flower from spring to autumn · Erect pollinator hanging baskets and window boxes · Erect solitary bee nest boxes · Map your garden on the pollinator friendly map viewer	*Appendix 8*: *Gardens: actions to help pollinators* *Appendix 9: Pledge your garden for pollinators* *Appendix 10*: *Pollinator sign template* *All Ireland Pollinator Plan* https://pollinators.ie/aipp-2021-2025/

Action	Reason	Location	Method	Appendix/Resource
			· Erect pollinator zone signage in public spaces to inform the public and create awareness in the community	*Map your garden* https://pollinators.biodiversityireland.ie/
Plant native trees and shrubs	To increase insect life including pollinators and provide food sources for bats and birds To counter the future effects of ash dieback disease	· Private gardens and public spaces including St. Brendan's National School, Tralee Bay Sailing Club, Tralee-Fenit Greenway	· Plant native shrubs and trees including bramble, ivy, dog rose, elder, hawthorn, blackthorn, holly, strawberry (arbutus) tree, rowan, willow, crab apple, oak, hazel, birch, Scots pine · Given the exposed coastal nature of Fenit village and surrounds some trees will require sheltered conditions for planting	*Appendix 7*: Local community actions to help pollinators *All Ireland Pollinator Plan* https://pollinators.ie/aipp-2021-2025/ *The Tree Council of Ireland* has advice on what tree to plant where: https://www.treecouncil.ie/the-right-tree-in-the-right-place *Wildlife Trust* https://www.wildlifetrusts.org/actions/how-make-woodland-edge-garden-wildlife
Increase bug life	To maintain and increase small mammal and insect life	· Private and public spaces including St. Brendan's National School	· Build a log or stone pile · Build a bug hotel	*RSPB* https://www.rspb.org.uk/get-involved/activities/nature-

Action	Reason	Location	Method	Appendix/Resource
				on-your-doorstep/garden-activities/build-a-bug-hotel/ *Wildlife Trust* https://www.wildlifetrusts.org/actions/how-build-bug-mansion
Create a garden pond	To create habitat for freshwater wildlife such as frogs, dragonflies and damselflies, water beetles and other insects, which in turn attract birds and bats	· Private gardens	· Ponds are very important for wildlife and while Fenit has copious amounts of seawater it has little freshwater habitat. · Create a small shallow pond in your garden by removing the grass turves, laying suitable liner, then fill it with collected rainwater and wait for the wildlife to come!	*Appendix 3*: Creating garden ponds for wildlife
Avoid use of pesticides	To protect insect life including pollinators	· Private and public spaces	· Pesticides include insecticides, fungicides and herbicides and kill beneficial plants and animals as well as unwanted or harmful ones. · Avoid use of herbicides on lawn or verges or pavements · Hand weeding, mulching, weed suppressant fabric and planting good ground cover reduce the need for sprays	
Use chemical free cleaning products	To protect coastal water quality	· Private, industrial and commercial users	· Chemical products are often toxic to aquatic life and can pass from a household drain into coastal waters via septic tank · Chemical free examples include castile soap, baking soda, vinegar, cooking oil	Numerous online resources available

Action	Reason	Location	Method	Appendix/Resource
Use peat free compost	To protect existing bogs, which are important sources of carbon and wildlife	· Private and public spaces	· Avoid use of peat-based compost to help protect peatlands	
Invasive species	To protect native flora and prevent further spread	· Private and public spaces	· Areas of montbretia can be dug out removing plant material and underground corms and can be buried · Leave ground to colonise naturally with native grasses and flowers	*Invasive Species Ireland* https://invasivespeciesireland.com/species-accounts/established/terrestrial/montbretia

5 MONITORING AND REVIEW

This Biodiversity Action Plan is for the period 2022 to 2026. The plan should be reviewed every 5 years to establish what has been achieved and to review the actions still to be worked on, and how future actions might be resourced.

Appendix 1

Photographic record

Coastal grassland near St. Brendan’s statue

Coastal grassy wildflower area beside the slipway

Wildflowers and grasses near the shore

Wall lichens and wildflower verge in the village

Intertidal cobble and rocky shore habitat

Tree mallow growing beside old stone wall

Rocky shore to the left and bramble scrub and grassland above the shore

Grassland and bramble scrub between The Paddocks and the shore

Abandoned old houses in the village

Wildflower garden with ivy leaved toadflax growing on the old stone wall to the left

Old Lifeboat House

Abandoned old house surrounded by broadleaved trees, mainly sycamore

Agricultural field in the middle of village bounded by old stone wall supporting mosses, lichens and wildflowers. Chemical spraying evident on road verge on far right.

Unmown wildflower meadow in the grounds of Tralee Bay Sailing Club

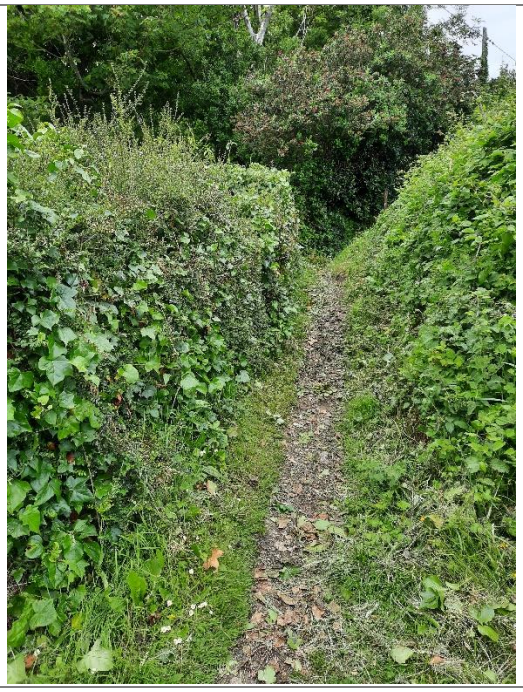
Unmown wildflower meadow in the grounds of Tralee Bay Sailing Club

Unmown wildflower meadow in the grounds of Tralee Bay Sailing Club

Wildflower area at Tralee Bay Sailing Club

Wildflowers on slope at Tralee Bay Sailing Club

Rock samphire, ivy leaved toadflax and lichens on old stone wall



Village laneway

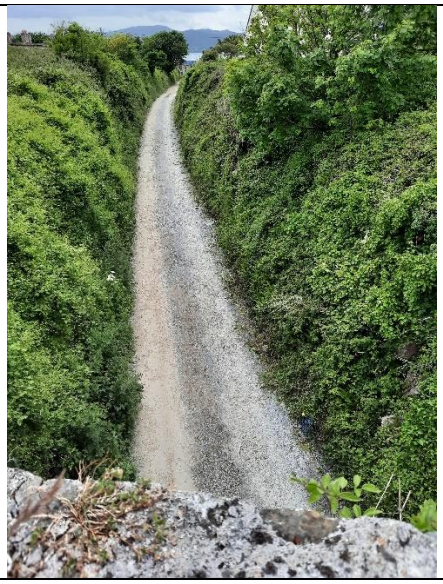
Abandoned old coastguard station

Village laneway lined with Montbretia

Evidence of ash dieback disease from dieback of shoots evident on the tree crown

Shared green space at Castleview

Broadleaved trees at Castleview shared green space



View of the greenway from a masonry bridge

View of the wildlife corridor along greenway

View of elder tree growing alongside masonry arch bridge along the greenway near church

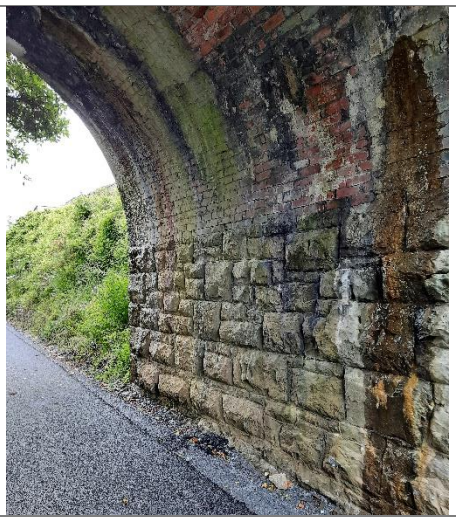
View of mix of native wildflowers colonising gravels at entrance to soccer pitch

View of bramble scrub growing in a field beside Island Road

View of biodiverse old stone wall on roadway off Island Road

View of agricultural field beside Island Road

View of bramble scrub colonising field beside Island Road



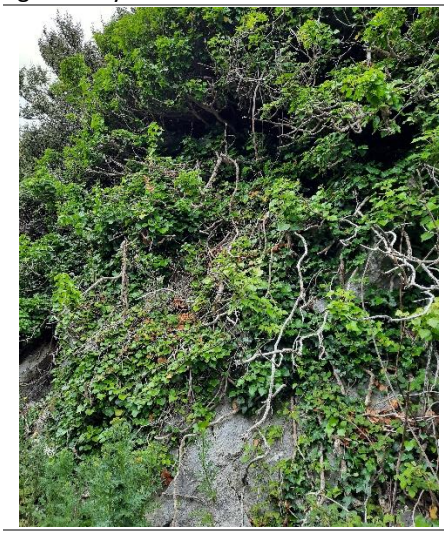
Masonry arch bridge along the greenway

Spear thistle along the greenway

Maidenhair spleenwort on exposed limestone rock along the greenway

Acoustic stationary bat detector attached to tree trunk and recording bat activity at night along the greenway

Willowherb along the greenway



Ivy colonising exposed limestone rock along greenway rock face

Wild carrot along the greenway

Ragwort along the greenway

Abandoned old cottages adjacent the greenway and old signal post for the railway

Old mans beard invading hedgerow in autumn

Barrow Harbour at low tide

Exposed eel grass beds in mid ground at Barrow Harbour at low tide

Eel grass at Barrow Harbour on which brent geese from high-Arctic Canada feed in winter

Salt marsh at Barrow Harbour

View of coastal protection initiative and rocky shore in the background

Appendix 2

Bird survey results

Breeding Bird Survey

The route followed by surveyors included: viaduct & St. Brendan's monument & pier near harbour offices; R558 through village; local road north towards Barrow Harbour; West at T-junction to shore; SW along mud shore; South along rocky shore; East at Diving area and shore to carpark.

Date of survey: 26/04/2021

Common Name	**Latin name**	**No. observed**	**Location**
Black Bird	*Turdus merula*	4	Village
Blue Tit	*Parus caeruleus*	1	Village
Chiffchaff	*Phylloscopus collybita*	1	Village
Collard Dove	*Streptopelia decaocto*	4	Village
Common Gull	*Larus canus*	12	Shore
Cormorant	*Phalacrocorax carbo*	1	Flying over bay
Curlew	*Numenius arquata*	1	Shore
Dunnock	*Prunella modularis*	2	Scrub
Great Black Backed Gull	*Larus marinus*	3	Flying over bay
Great Tit	*Parus major*	1	Village
Grey Heron	*Ardea cinerea*	1	Shore
Hooded Crow	*Corvus cornix*	2	Village
House sparrow	*Passer domesticus*	2	Village
Magpie	*Pica pica*	2	Village
Meadow Pipit	*Anthus pratensis*	1	Grassland near shore
Mistle Thrush	*Turdus viscivorus*	1	Village
Pied Wagtail	*Motacilla alba yarrellii*	2	Pier, village
Robin	*Erithacus rubecula*	4	Village
Rock dove	*Columba livia*	3	Pier, flying over
Rock pipit	*Anthus petrosus*	8	Pier
Shag	*Phalacrocorax aristotelis*	1	Wheel rock
Shelduck	*Tadorna tadorna*	1	Flying over bay
Skylark	*Alauda arvensis*	1	Grassland near shore
Starling	*Sturnus vulgaris*	10	Village
Stonechat	*Saxicola torquatus*	2	Scrub
Swallow	*Hirundo rustica*	3	Village
Turnstone	*Arenaria interpres*	1	Shore
Whimbrel	*Numenius phaeopus*	10	Shore (migrating from Africa to breeding grounds in Iceland in next month)
Wood pigeon	*Columba palumbus*	3	Village
Wren	*Troglodytes troglodytes*	2	Village

Date of survey: 14/06/2021

Common Name	**Latin name**	**No. observed**	**Location**
Black Bird	*Turdus merula*	4	Village
Buzzard	*Buteo buteo*	1	Shore by Fenit House
Collard Dove	*Streptopelia decaocto*	4	Village
Cormorant	*Phalacrocorax carbo*	4	Pier/inshore
Curlew	*Numenius arquata*	1	Shore
Great Black Backed Gull	*Larus marinus*	2	Flying over bay
Great Tit	*Parus major*	4	Fields north of village
Grey Heron	*Ardea cinerea*	1	Shore
Herring Gull	*Larus argentatus*	3	Pier
House sparrow	*Passer domesticus*	7	Village
House martin	*Delichon urbicum*	1	Shore/fields
Linnet	*Carduelis cannabina*	1	Fields north of village
Magpie	*Pica pica*	2	Village
Pied Wagtail	*Motacilla alba yarrellii*	1	Village
Robin	*Erithacus rubecula*	2	Village
Rock pipit	*Anthus petrosus*	7	Pier
Shag	*Phalacrocorax aristotelis*	3	Wheel rock
Shelduck	*Tadorna tadorna*	5	Flying over bay
Skylark	*Alauda arvensis*	1	Shore
Song thrush	*Turdus philomelos*	1	Shore/fields
Starling	*Sturnus vulgaris*	100+	Village
Swallow	*Hirundo rustica*	8	Village/shore
Wood pigeon	*Columba palumbus*	4	Village
Wren	*Troglodytes troglodytes*	1	Village

Winter Bird Survey

The route followed by surveyors included: viaduct & St. Brendan's monument & pier near harbour offices; R558 through village; local road north towards Barrow Harbour; West at T-junction to shore; SW along mud shore; South along rocky shore; East at Diving area and shore to carpark.

Date of survey: 18/10/2021

Common Name	**Latin name**	**No. observed**	**Location**
Black-headed gull	*Larus ridibundus*	6	Barrow Harbour
Black-tailed godwit	*Limosa limosa*	50	Barrow Harbour
Chiffchaff	*Phylloscopus collybita*	2	Village
Chough	*Pyrrhocorax pyrrhocorax*	1	Shore
Common Gull	*Larus canus*	33	Shore
Cormorant	*Phalacrocorax carbo*	6	Shore
Dunlin	*Calidris alpina*	<50	Barrow Harbour
Gannet	*Morus bassana*	12	Shore
Great crested grebe	*Podiceps cristatus*	1	Shore
Greenfinch	*Carduelis chloris*	3	Shore
Golden plover	*Pluvialis apricaria*	85	Barrow harbour/shore
Goldfinch	*Carduelis carduelis*	3	Village
Great Black Backed Gull	*Larus marinus*	7	Shore
Herring gull	*Larus argentatus*	6	Barrow Harbour
Jackdaw	*Corvus monedula*	10+	Village
Lapwing	*Vanellus vanellus*	18	Shore
Linnet	*Carduelis cannabina*	70	Shore
Little egret	*Little*	6	Barrow Harbour
Magpie	*Pica pica*	2	Village
Meadow Pipit	*Anthus pratensis*	1	Village
Oystercatcher	*Haematopus ostralegus*	12	Shore
Redshank	*Egretta garzetta*	30+	Shore
Red-breasted merganser	*Mergus serrator*	10	Barrow Harbour
Ringed plover	*Charadrius hiaticula*	<50	Barrow Harbour
Robin	*Erithacus rubecula*	1	Fields north of village
Sanderling	*Caliddris alba*	140	Barrow Harbour
Starling	*Sturnus vulgaris*	25	Shore
Wheatear	*Oenanthe oenanthe*	1	Shore
Whooper swan	*Cygnus cygnus*	1	Shore

Appendix 3

Creating garden ponds for wildlife

creating

GARDEN PONDS

for wildlife

Pond Conservation

For life in fresh waters

www.pondconservation.org.uk

World of Water AQUATIC CENTRES

www.worldofwater.com

© Joseph Kelland

WATER SAFETY

The number of accidental drownings in ponds is very low, but small children are particularly at risk.

• Spot the dangers - water may look safe, but it can be dangerous. Ponds covered in duckweed can look like a solid surface to a young child, for example. Think about all potential problems and keep away from danger.

• Always supervise young children whilst they are near a pond, especially when conducting activities such as a pond dip.

• Remain vigilant - a large proportion of drownings are the result of accidental immersion in ponds due to slips and falls from the bank. This is especially important for young children and toddlers, whose sense of danger and balance is not yet fully developed.

• Talk to children before dipping to make them aware of the dangers

• Wash your hands after putting them in a pond, especially before eating or handling food. Cover cuts and grazes with a waterproof plaster

For more information visit the RoSPA website: http://www.rospa.com/leisuresafety/adviceandinformation/watersafety

Front cover photo, Paul Lacey
Migrant Hawker (*Aeshna mixta*) © Paul Lacey

Pond Conservation
For life in fresh waters

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Pond Conservation
For life in fresh waters

Pond Conservation is the UK's national charity dedicated to protecting the wildlife of our freshwaters: ponds, rivers, streams and lakes. We give advice, carry out research, promote practical action and lobby policy makers to ensure that freshwater wildlife and habitats have a secure future.

www.pondconservation.org.uk

This publication has been kindly sponsored by World of Water, the UK's leading water gardening specialist. For further information and your nearest store please visit

www.worldofwater.com

WHY PONDS ARE IMPORTANT

"It's really important for British wildlife that gardeners do their bit for aquatic life – freshwater plants, insects, amphibians and mammals all rely on our commitment."
Alan Titchmarsh

There are around 478,000 ponds in the countryside of England, Wales and Scotland, providing a unique and biodiverse wildlife habitat, and playing an important role in our history and culture.

Sadly, countryside ponds are threatened by pollution, the changing climate, drainage, and development, and many are in very poor condition. However, we estimate that the nation's gardeners have created a staggering additional 2-3 million garden ponds. As well as providing much pleasure and enjoyment, these small waterbodies increase the habitat available for our freshwater wildlife, and may link fragmented wildlife communities.

In this booklet we aim to help gardeners make their ponds even better for wildlife, creating habitat for a wide range of aquatic plants and animals.

Kingfisher © Paul Lacey

GARDEN POND 'SHOPPING LIST'

- Rainwater butt and downpipe conversion kit
- Liner
- Play sand or clean gravel
- Native plants
- Pond Conservation guide to creating a wildlife pond in your garden!
- A love of wildlife

CREATING A GARDEN POND

'A Garden Pond is a joy and you can make one in a weekend"
Alan Titchmarsh

POND CONSERVATION'S TOP TIPS FOR CREATING THE PERFECT WILDLIFE POND:

• Clean water is essential for making great wildlife ponds. Rainwater is usually best, as tap water often has high levels of dissolved nitrogen and phosphorus. These nutrients will discourage aquatic plants and encourage growth of algae and duckweeds.

• Waiting for rain? Set up water butts to collect water from the roof of your house, a garage or an outbuilding a couple of months before you dig your pond, ready to fill it up once it is lined. You can also use this water to top up your pond during the drier summer months. Doing this means you won't have to reach for your hose.

• Provide homes for aquatic creatures by making natural edges with really shallow water. The greatest variety of animals and plants live in shallow water at the very edge of the pond, often in just a couple of centimetres of water. The best wildlife ponds have very gently shelving natural edges, fringed by grasses, creating perfect homes for amphibians, and for invertebrates like dragonflies and water beetles.

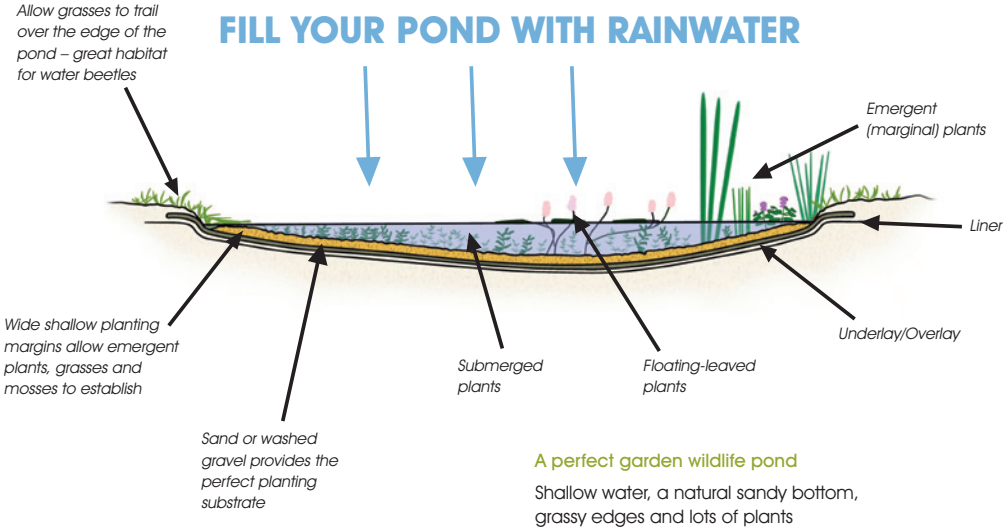
• **Shallow ponds are great** – Unless you are keeping fish, the deepest areas need to be no more than 25-30 cm (1 foot) deep. This keeps all of the pond well oxygenated and well lit. It also means you can see to the bottom, helping you to enjoy your pond more. If you want a deeper pond, try to make sure its surface area is 5-10 times the maximum depth, otherwise there is a good chance you'll suffer from deoxygenation problems.

• **Pond substrates** – Use sand and washed gravel, to provide a substrate for planting into, and places for creatures like dragonfly larvae to burrow into.

• **Let wildlife come to your pond naturally** You don't need to add sludge, from another pond, to your pond to 'get it started'. In the spring, small animals will arrive within minutes, water beetles and dragonflies in just a couple of days, and amphibians within the first year. Even plants will establish in time, with grasses and mosses creeping in to provide good habitats for aquatic creatures.

• **What about fish?** – In the wild, fish are a natural part of the wildlife of some pond types. But they can overwhelm small garden ponds and will eat smaller animals, including frog and newt tadpoles. They can also pollute the water, unless you install filters. If you want to keep fish, create some areas of really dense plant cover, encourage lots of grasses at the edges, and make areas that the fish can't get to. You could also make a separate fish pond and have the best of both worlds.

• **Trees and falling leaves** – If your pond is near to bushes or trees, the leaves and twigs falling into the water will provide food, shelter and case building materials for animals. They also provide shade, which will stop the pond drying out so quickly in hot summers. Don't make shady ponds too deep, as a thick layer of leaves can build up on the bottom, deoxygenating the water, and reducing its value for wildlife.



A perfect garden wildlife pond

Shallow water, a natural sandy bottom, grassy edges and lots of plants

STEP-BY-STEP GUIDE

Step 1. Mark out the pond shape that you want

For a wildlife pond, the shape is not very important, so you can make a pond that has a 'natural wiggly shape', or is a 'formal' square or a circle - it depends on what you think looks good in your garden.

Step 2. Remove the turves

Start to dig out the turves but don't dig down too deep. Keep some back to secure the liner around the edge of the pond, but don't put them in the water, as they will add a massive blast of polluting nutrients.

Step 3. How deep? – Shallow water is key for wildlife

Ideally a wildlife pond should have lots of shallow water, with wide shallow margins and gently sloping edges. If you want a pond that is a half metre or more deep it needs to be much bigger or you'll end up with very steep sides.

Removing the turves can also create very steep edges to your pond, so you will need to use the spoil to re-profile the edges.

Step 4. Check the level

It's important to get the pond level, otherwise you will have bare liner showing on one side. You'll need a spirit level on a long piece of wood that will go right across the pond. If necessary remove the turves and bank up the lower side to level it up.

1

2

3

4

5

6

Step 5. Laying the liner

Carefully remove stones from the bottom and sides of the hole that may puncture your liner. Then cushion it further with sand and a layer of underlay. You can also put another layer of underlay over the top of the liner, to further protect it, and provide a better substrate for aquatic plants and mosses.

Step 6. Add the water

If you are patient you can wait for the pond to fill with rainwater, or you can collect rainwater in your water butts and use this. In many parts of Britain it is better not to use tap water, which is high in dissolved nutrients, and is too 'rich' for your pond.

Once there is water in the pond you can trim back any excess liner, and cover the edges using the turves you removed earlier. However you need to ensure the topsoil can't get washed back into the pond, so place them carefully, not sloping into the water. The grasses will soon grow down to the water covering the edges.

Step 7. Encouraging Wildlife

If you want to make the pond more natural looking, and give your plants somewhere to root, add children's play sand to your pond. This is chemically inert so there are no nutrient pollution problems. Another option is gravel – as long as it is washed thoroughly first. Don't add soil or topsoil – and try not to get mud in your pond, as if you start with a pond that looks like a mud bath, it is likely to remain polluted.

And the wildlife? Well that can start to arrive on day one with water beetles flying in.

WHICH LINER SHOULD I USE?

Liner Type	Advantages	Considerations
Flexible pond liner • Synthetic rubber polymers e.g. butyl, EPDM • Plastic e.g. PVC	• Affordable • Flexible • Perfect for smaller ponds, such as garden ponds • Rubber liners, are very durable and more flexible than PVC • Most rubber liners can be made to any size, to order	• Advisable to use underlay protection matting • Sharp stones should be cleared reducing damage risk • Liners should not be exposed to direct sunlight • Harder to shape than natural materials
No liner	• No cost • Provides a natural substrate for plants and animals • Can be easily shaped • Easy to make changes to the pond • Lifespan unlimited	• Not many gardens have water-holding soil. If in doubt dig test holes to check this • Natural ponds can sometimes be affected by poor groundwater quality
Concrete	• Very robust	• Expensive • Labour intensive • Requires a large quantity of concrete • Prone to cracks and leaks • Requires expensive sealant • Cannot be shaped as easily as natural substrates
Puddled clay	• Provides a natural substrate for plants and animals • Repairs and alterations possible	• Requires a large amount of clay • Difficult to source • Can be expensive • Technically difficult to make and labour intensive • Liable to crack in dry conditions
Bentonite - a natural mineral clay, sold as sodium bentonite, supplied in dry powdered form, or as part of a geosynthetic clay liner (GCL)	• Can be used to boost the natural water-retaining properties of soils • Provides natural substrate for plants and animals • Repairs and alterations possible • Self-sealing around small punctures	• Requires specialist contractors • Not suitable for small garden ponds • Results variable depending on soil type

CALCULATING POND LINER SIZE

To calculate the amount of pond liner you will need in order to create your pond, you can use this equation:

(Length + 2 depths + 30 cm) by (width + 2 depths + 30 cm)

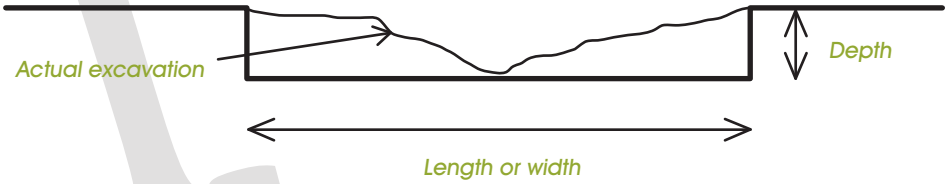
Example: for a pond with the final dimensions of 10 m long, 5 m wide and 0.5 m deep:

(10 + (2 x 0.5) + 0.3) by (5 + (2 x 0.5) + 0.3)

= liner dimensions required are 11.30 m by 6.30 m

This will overestimate the amount of liner needed, but the excess will be useful for anchoring the liner around the edge of the pond, whilst still allowing for a small margin of error.

CALCULATING THE AMOUNT OF FLEXIBLE LINER REQUIRED



PLANTING WILDLIFE PONDS

Plants are very important for a wildlife pond. As well as making your pond look beautiful, they also provide homes for your aquatic creatures.
To decide which plants will be best for pond wildlife, you need to think about the world from an aquatic animal's eye-view. Almost all pond animals live in the safety of dense vegetation, and most in very shallow water - often only a few centimetres deep. The plants that provide the best habitats are those that create a diverse and complex underwater structure at the water's edge.

Low-growing grasses and marginal wetland plants that grow out in the water are excellent for this. In other parts of the pond you can include different types of plant with a range of submerged and floating stems and leaves to give the widest range of habitat types. Encourage plants to grow in different densities and ranges of water depths.

MARGINAL AND FLOATING LEAVED PLANTS

Most native marginal and floating-leaved wetland plants are very robust. They can be introduced to ponds at any time of the year, and are usually best added as small rooted plants pushed directly into the sediment. Wetland plants spread rapidly, so planting densities of 2-3 plants per square metre will usually give good cover within a year.

Submerged Plants

To successfully establish native submerged pond plants, make sure that the pond has good water quality, low in nutrients.

Care of Your Plants

Plants may need managing after the first few years, especially species such as bulrush and yellow flag, which, if allowed to spread, will eventually dominate the pond. Thinning plants or cutting off the seed heads before they ripen will allow time and space for other species to grow, and prevent a lot of effort at a later stage.

Don't get too carried away with plant management and take out all your plants, even if they are non native ones. You should always leave some habitat for amphibians and other pond animals, even during the winter months. Any plants removed should be carefully composted, and neither plants or animals should ever be released into the wild.

For more information on this visit the 'Be Plant Wise Campaign'

(www.beplantwise.direct.gov.uk/index.html)

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CHOOSING PLANTS THAT ARE GOOD FOR WILDLIFE

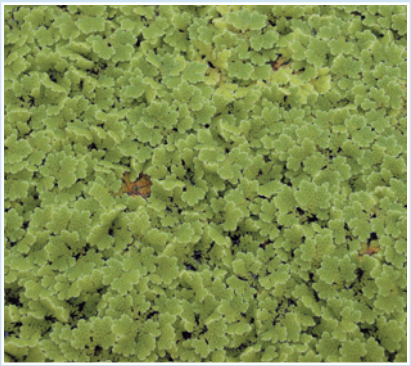
Type of plant	Names	Comments
Plants next to the pond *Plant terrestrial plants in wildflower areas adjacent to your pond.*	• *Cow Parsley (Anthriscus sylvestris)* • *Devil's-bit Scabious (Succisa pratensis)* • *Hemp Agrimony (Eupatorium cannabinum)* • *Teasel (Dipsacus fullonum),* • *Purple loosestrife (Lythrum salicaria)* • *Red Valerian (Centranthus ruber)* • *Yarrow (Achillea millefolium)*	*Create a wildflower area near your pond, providing a habitat for amphibians, and the adult forms of some aquatic insects, like hoverflies, which will nectar there. Flat-topped flowers like cow parsley are especially useful because they offer broad 'heli-pads' to land on.*
Low-growing wetland grasses *Can be planted in dry ground, or a few cm of water.*	• *Creeping Bent (Agrostis stolonifera) – which is often present as a lawn grass, but also likes its feet in water* • *Small sweet-grasses (Glyceria fluitans)*	*Creeping wetland grasses may look rather boring but they provide an excellent habitat for newts, water beetles and many other creatures.*
Marginal herbs and rushes that grow into the water *Plant in 2-10 cm depth of water.*	• *Lesser Spearwort (Ranunculus flammula)* • *Marsh Pennywort (Hydrocotyle vulgaris)* • *Water Forget-me-not (Myosotis scorpioides)* • *Water Mint (Mentha aquatica)* • *Watercress (Rorippa nasturtium-aquaticum)*	*Where possible include marginal plants, like the ones listed here, that can extend out into the water and provide a submerged habitat for animals.*
Marginal plants with attractive flowers and architecture *Plant in 2-10 cm depth of water.*	• *Marsh Cinquefoil (Potentilla palustris)* • *Marsh Woundwort (Stachys palustris)* • *Marsh-marigold (Caltha palustris)* • *Pendulous Sedge (Carex pendula)* • *Purple Loosestrife (Lythrum salicaria)* • *Ragged-robin (Lychnis flos-cuculi)* • *Water Dock (Rumex hydrolapathum)* • *Yellow Iris (Iris pseudacorus)*	*These native species are well adapted for planting on damp banks and in marsh areas.*

Tall emergents *Plant in 2-10 cm depth of water.*	• *Branched Bur-reed (Sparganium erectum)* • *Bulrush (Typha latifolia)* • *Greater Pond-sedge (Carex riparia)* • *Hard Rush (Juncus inflexus)* • *Lesser Reedmace (Typha angustifolia)* • *Reed Sweet-grass (Glyceria maxima)* • *Soft Rush (Juncus effusus)*	*Tall marginal plants are good for wildlife but some can come to dominate your pond. To keep them in smaller ponds, cut back regularly.*
Floating-leaved plants *Plant in 15 cm-30 cm depth of water.*	• *Amphibious Bistort (Persicaria amphibia)* • *Broad-leaved Pondweed (Potamogeton natans)* • *Fringed Water-lily (Nymphoides peltata)* • *White Water-lily (Nymphaea alba)* • *Yellow Water-lily (Nuphar lutea)*	*Amphibious Bistort and Broad-leaved Pondweed are easy to establish and their small leaves look appropriate in small ponds. They are also extensively used by invertebrates.*
Submerged plants *Float in deep water.*	• *Common Water-starwort (Callitriche stagnalis)* • *Curled Pondweed (Potamogeton crispus)* • *Rigid Hornwort (Ceratophyllum demersum)* • *Spiked water-milfoil (Myriophyllum spicatum)* • *Water-crowfoot (Ranunculus aqualtilis)*	*Submerged plants can be fussy and many native species fail, particularly if pond water quality is poor.* *These are some of the most tolerant.*

NUISANCE PLANTS – THE ALIEN INVADERS!!

Plants to avoid		
These plants are not recommended as they are invasive, non native species that could rapidly overwhelm your pond, replacing less vigorous native plants. *They can also escape into the wild, causing many problems and considerable expense to remove them.*	• *New Zealand Pigmyweed/ (Crassula helmsii)* • *Parrot's-feather (Myriophyllum aquaticum)* • *Water Fern (Azolla filiculoides)* • *Floating Pennywort (Hydrocotyle ranunculoides).*	*Avoid introducing non-native plants into ponds in the wider countryside.* *Compost any plant materials removed.*
These plants are vigorous non native species, but will be providing habitat for your pond creatures.	• *Curly Waterweed (Lagarosiphon major)* • *Nuttall's Pondweed (Elodea nuttallii)* • *Canadian Pondweed (Elodea canadensis).*	*Avoid introducing non-native plants into ponds in the wider countryside.* *Compost any plant materials removed.*

New Zealand Pigmyweed (*Crassula helmsii*)



Water Fern (*Azolla filiculoides*)

Parrot's-feather (*Myriophyllum aquaticum*)

Curly Waterweed (*Lagarosiphon major*)
© Rod d'Ayala

MANAGING YOUR POND

THE POND CALENDAR

SPRING: MARCH-MAY

Wildlife

- Frogspawn is laid from January onwards, starting in the west/south west of England and Wales.
- Newts (Smooth, Palmate or, for the lucky few, Great Crested) and Common Toads laying eggs from early Spring onwards.
- On warmer days backswimmers, water beetles, pond skaters and lesser water boatmen will be flying to the pond.
- Shrimps, water slaters, pond snails and other animals start to breed as the water warms up; Pond Olive mayflies begin to emerge.
- Brightly coloured yellow and black hoverflies will visit the pond: their rat-tailed larvae which live in the water are the ultimate ugly ducklings!
- Marginal and underwater plants start to grow.

Management

- New plants grow quickly at this time, plant them in inert sand and gravel.
- Marginal plant thinning/dividing: you can trim plants back to keep things tidy, but for wildlife don't remove more than 25% of plant cover.
- You can remove some submerged plants and dispose of them on the compost heap – but remember they may be the only animal habitat in the pond.
- If you want to control duckweed, start now.

SUMMER: JUNE-AUGUST

Wildlife

- Damselflies start to emerge: the Large Red comes first followed by the blues. Adult frogs may be lurking to catch them.
- Frog tadpoles metamorphose and leave the pond.
- Alderflies visit the pond to lay eggs on rushes and reeds in May.
- Pipistrelle Bats may be hunting over larger garden ponds.
- Dragonflies emerge in June.
- Adult damselflies and dragonflies lay eggs all summer. The Common Darter could still be laying into plants, at, or just below, the water line into September.
- Caddisflies skim over the water at dusk in mating swarms.

Management

- Water levels fall during the warm weather. Tadpoles, and other animals enjoy the warm shallow water (however, if it becomes too hot/dry, then consider moving them to 'mini-ponds' in more shaded areas).
- If you want to top up, use rain water, and do not reach for the hose.
- Skim off unwanted duckweed: this will also help reduce nutrient levels, but don't leave it on the edge of the pond – put it on your compost heap.
- Plants can be thinned in the summer, if they're not providing essential cover for animal life. Remember to dispose of them on the compost heap.

AUTUMN: SEPTEMBER-NOVEMBER

Wildlife

- Smaller animals have finished egg-laying, some are hatching and tiny larvae are getting ready for winter.
- Frog and newt tadpoles may over-winter.
- Plants begin to die back.

Management

- Pond clearing. Gently remove some leaf litter but remember it can be a good habitat and food source for smaller animals.
- Remove non-native and other unwanted plants, and dispose of them on the compost heap.
- Avoid leaving plants on the banks near the pond as the nutrients locked up in the plants will drain back into the pond.
- To save the pond animals, wash plants and leaves out in a tub of water.

WINTER: DECEMBER-FEBRUARY

Wildlife

- Under the water, life goes on, with the larvae of mayflies, dragonflies, and water beetles over-wintering under the ice. You may have hibernating frogs and sometimes newts in the water too.
- Most plants won't start growing until February, unless you have 'winter-green' stoneworts or mosses.

Management

- Under ice cover, shallow ponds with plenty of underwater plants and light will remain well oxygenated.
- If you have fish or amphibians, and ice covers the pond for more than 2 or 3 days, run a pump or fountain to keep oxygen levels up.
- A hole in the ice won't make any significant difference to the oxygen levels in the pond, but it may help air breathing creatures which can swim to the surface for air. It'll also give the birds somewhere to drink.
- Brush the snow off the ice to let light into the pond – this can help keep oxygen levels up, but don't venture out on to the ice.

PROBLEM SOLVING WITH OUR POND CLINIC

Help – my pond has turned green!

Green 'pea-soup' pond water is caused by tiny green algae. These, together with filamentous algae (blanket weed), and small floating-leaved species, like duckweed, are boosted by too many nutrients in the water - especially nitrate and phosphate.

New ponds or ponds that have recently been dredged often have temporary algal blooms. These are usually short-lived, and the system will settle down within a season or two, as the number of tiny zooplankton (water fleas like *Daphnia*) build up and eat the algae. However, older ponds which have a persistent surface cover of duckweed or green-coloured water are harder to manage.

Controlling algae and duckweed

Controlling algae and floating plants like duckweed can be difficult - particularly for larger ponds. The best solution is to reduce the levels of nutrients in the water. Other methods are less satisfactory because they only deal with the symptoms, so you'll need to repeat the treatments.

Controlling algae and duckweeds	
The long term solution - prevention	*Reduce nutrient levels by: removing bottom sediments; preventing soil or fertiliser running into the pond; and using rain water, not tap water, to top up the pond in summer.*
Natural Predators	*Populations of zooplankton (such as water fleas) build up naturally during the spring and eat the algae.*
Manual clearance	*Clear blanket weed using a rake,or by twisting it on a stick. Duckweeds and Water Fern can be scraped from the surface using a board or a sieve. Compost the plants away from the pond.*
Encouraging submerged plants	*Submerged aquatic plants (often called oxygenators) can help soak-up the pond's nutrients. However, many native submerged plants will not grow in nutrient-polluted water, so only add them when you have improved the water quality.*
Shade	*Shade can reduce problems with algal growth, so locate your pond in a shady spot. Larger leaved floating plants can also provide shade on the water surface.*
Barley straw	*Barley straw rots down to produce a range of chemicals that kill many types of algae. It takes up to a month to become active, and it's best to add it in spring and remove it when it has turned black, about six months later. However, barley straw is not a cure, so applications will need to be ongoing.*
Pond filtration systems	*You can buy a wide range of pump and filter systems that will remove nutrients and algae from the water. There are a number of different types, including biological filters and ultraviolet (UV) light-based systems. These can be run alone, or if you have fish, in combination.*
Pond dyes /colorants	*Pond dyes work by blocking some wavelengths of light, so that algae cannot grow. The dye degrades naturally over a number of weeks and then needs to be reapplied to remain effective. Although non-toxic to animals, these dyes will also kill your other submerged pond plants!*
Other treatments	*There are a number of other products containing enzymes, bacteria and minerals available for reducing blanket weed and/or algae in your pond. To be effective always follow the instructions.*

WHY IS MY POND WATER BROWN?

There are two types of "brown" water:

- Clear with a brown tint – the colour of a cup of tea before you add milk;
- Muddy brown – like tea after you've added milk!

If your water is clear but tinted brown, it is likely to be tannins which have leached out of leaves in the pond. If your pond has an inflow from a peaty area this will also colour your water brown.

If your water is a cloudy or muddy brown (or grey) colour, then this is usually sediment stirred-up from the pond bottom. The most common culprits are fish, but sometimes ducks and dogs cause problems. Some new ponds can remain cloudy for weeks or even months, whilst the bottom sediment settles back down again, particularly where the pond has a clay base. If your pond is new and still settling down, it is best to wait patiently. However, if the banks above the water level are bare then it's worth trying to plant them up fairly quickly, for example with a grass-mix, to prevent more sediment from washing into the pond.

WHAT TO DO IF YOUR POND DRIES OUT

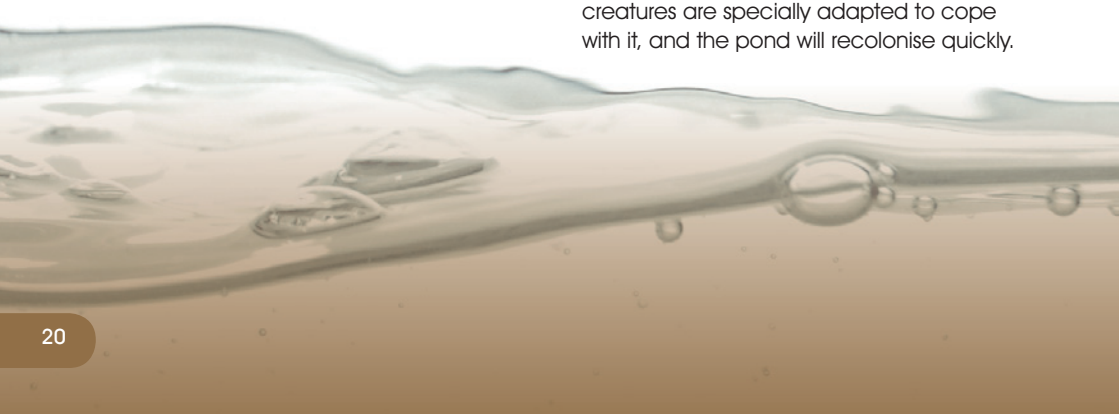
People often worry when their water levels fall in summer. However, in natural ponds, a water level drop of at least 0.5 m is typical in summer. These falling water levels create one of the most biologically rich areas of a pond – 'the drawdown zone'.

You can let pond levels drop quite low before losing any animals (except fish). Most creatures, including tadpoles, will be happy in just two to five centimetres of water – especially if there are plenty of plants or algae to keep the water oxygenated.

Overheating may be a problem in shallow ponds. If the water temperatures get to over 35 °C (which is possible even when air temperatures are around 30 °C), then some animals, including tadpoles and water slaters, will die. At this stage it is worth topping-up.

If you have clean water ponds filled with rain water, and want to avoid adding unwanted nutrients and chemicals to your pond, what can you do?

- Use water from rainwater butts to maintain a few centimetres of water in the bottom.
- Just let the pond dry out – annual drying out of ponds has been a natural process for hundreds of millions of years. Many creatures are specially adapted to cope with it, and the pond will recolonise quickly.



• Rescue your creatures – and put them in the shade. Transfer plants and animals into buckets or tanks, making sure there is somewhere where amphibians can rest and climb out (or they can drown). Add the remaining pond water, so you can build up a good zooplankton population to help prevent algal blooms. If you have to fill the buckets with tap water, sieve out the creatures and plants when you return then to the pond (in a normal plastic kitchen sieve).

• Add a little tap water – you could add the minimal amount of tap water to keep the pond going.

I'VE GOT TO DRAIN MY GARDEN POND – HOW CAN I SAVE THE WILDLIFE?

If the pond needs to be completely drained, you can do a couple of things to help the existing inhabitants.

1. Let animals fly off. Most adult water beetles and water bugs (like backswimmers) can fly. So, if you first draw the pond down to a very low level (more or less damp mud), and leave the pond for a day, many animals will fly-off to find new homes, especially on a warm day.

2. Provide temporary accommodation. Save plants and pond animals in temporary mini ponds. Fill the containers with the pond water, and make sure that there are plenty of aquatic plants, so the animals can find shelter and food when you transfer them.

The plants may also have eggs attached, since many animals including damselflies, lay their eggs on and in plants.

Adult amphibians can be removed and placed in a dark, damp area in your garden (such as a log pile).

Note: If you have Great Crested Newts in your pond then legally you are not allowed to move them, or change their habitat, without a license.

3. For creatures that can't leave, when is the best time of year to drain my pond? There's no best time of year to drain a pond, as animals at different life-cycle stages are in there all year round and, whenever you do it, some will suffer. However, if you've got a species protected under law, like the Great Crested Newt, you should avoid draining the pond whilst they are present.

• Late summer is a good time to drain ponds for water beetles and bugs, because the adults can easily fly away in warm weather.

• Autumn is often the best time to drain a pond with amphibians, since most young will have emerged from the pond.

• If you have fish, avoid draining ponds in warmer summer months when oxygen levels in the water will be lower and they will be more susceptible to stress from handling.

SILTED UP PONDS AND DREDGING

You might need to dredge a pond if it is full of polluted sediments which are degrading the water quality and wildlife potential. However, dredging is not always appropriate, and sometimes you can cause greater damage by disturbing the wildlife in an old pond.

Dredging garden ponds

Small ponds or parts of pond can be cleared by hand using a net to gently skim off coarse material including leaves.

Remove semi-solid silt with buckets. For larger garden ponds you can use a sludge pump, which works like a giant vacuum cleaner sucking up mud from the bottom. Sludge pumps and pond vacuums come in a variety of sizes and are available to purchase, and sometimes hire, from your local aquatic retailer.

Spoil disposal

Before you start, you need to think about how to safely dispose of the spoil. In most cases semi-liquid spoil may be safely pumped onto your flower beds. However, under no circumstances should it be discharged into neighbouring water courses. Large quantities of muddy water will cause considerable pollution.

WHAT'S LIVING IN YOUR POND – DO THE BIG POND DIP

"Make a garden pond and you'll be astonished at the wildlife you encourage - from pond skaters and water boatmen to dragonflies and damselflies, frogs, toads and newts."
Alan Titchmarsh

WHAT YOU NEED

All you need to survey your pond is a net or sieve and a tray:

Nets or Sieves – A small net or kitchen sieve is perfect for getting in amongst the plants at the edge of the pond. Don't forget to cut the hooks off the sieve, so that you can get into all the little nooks and crannies where the animals might be lurking.

A white tray – A white tray is best, because it's much easier to see pond animals against a white background. You can make your own tray by sticking a sheet of white paper onto the bottom of a baking tray. Put a centimetre of water in the tray to keep the animals happy, but keep it shallow so that you can see them easily.

Where to dip

To find all the different kinds of animals in your pond, it's important that you check all the places they may be living in. Most animals live at the edge, and amongst plants, rather than in open water, so the best places to look are:

- Grasses trailing into water
- Roots of marginal plants
- Stems and branches trailing in the water
- Under the leaves of floating plants
- In the blanket weed
- Amongst the leaves and twigs on the bottom of the pond

Migrant Hawker (*Aeshna mixta*) © Paul Lacey

ANIMALS IN YOUR POND

Mayflies – There are 51 different kinds of mayfly in Britain. About 10 of these live in ponds, but the most commonly found is the Pond Olive (*Cloeon dipterum*). Pond Olives are fast colonisers of new ponds, including ponds in gardens.

To make good habitat for Pond Olive nymphs all you need is clean sand and gravel, though they also live happily on submerged plants, and on the grassy edges of ponds.

Caddisflies – Astonishingly, there are around 200 kinds of caddisfly in Britain. Most caddis larvae have a 'case', made by gluing bits of plant or sand grains together with silk to camouflage and protect themselves from predators, but not all.

The underwater larvae are much easier to find than the adults, which are nocturnal. Watch out for swarms of fast darting flies with very long antennae low over the water at dusk– they will almost certainly be caddis.

Alderflies – Although for the alderfly adult life is short, just a week or two from late April to the end of June, the larvae can live underwater for several years. They are one of the predators of the pond bottom, and are happy living in silty, vegetation-rich environments. There are only three different kinds of alderfly in Britain, and the commonest, the Mud Alderfly (*Sialis lutaria*), is the one you are most likely to find in garden ponds. Of all the animals associated with good quality ponds, alderflies are the scarcest and most difficult to attract. However, the better quality the pond is, the more likely they are to come, so providing clean water, plenty of plants and natural edges will help.

Dragonflies are quick to colonise new ponds, and are usually present in all good wildlife ponds, feeding voraciously on other small pond animals. 34 species have been recorded in Britain, but the first dragonflies to come to a new garden pond, are likely to be the Common Darter or the Broad-bodied Chaser. If you look amongst underwater plants you may also find the larvae of Emperor Dragonflies, and in shady, silty and overgrown ponds, Brown and Southern Hawker dragonflies.

Damselflies – Damselflies are related to dragonflies, and ponds are an important habitat for them too.

A good wildlife pond will nearly always have damselflies, and they quickly colonise new ponds. You will often see two or three common species, such as the Large Red Damselfly, the Azure Damselfly or the Blue-tailed Damselfly. Like dragonflies, damselflies are predators feeding on any small pond animals they can catch.

Adults damselflies lay their eggs on grasses, the stems of garden plants trailing in the water and fallen leaves – so don't pull these out if you want to encourage them.

Water beetles – Water beetles are one of the most diverse groups of freshwater animals with around 250 species in Britain.

You are most likely to find one of the commonest water beetles, the Common Black Diving Beetle, *Agabus bipustulatus*, but in a good wildlife pond there should be lots of different kinds of water beetle. Don't forget to look out for their larvae too, these ferocious predators live on the pond bottom and look a bit like alderfly larvae but with big and powerful jaws.

Water bugs – The term 'water bugs' is sometimes used for everything that lives under the water. But bugs are only those insects that have piercing mouthparts. There are around seventy different species of water bug. You might be able to spot: backswimmers, lesser water boatmen, water scorpions, water measurers and water stick insects in your pond. Bugs are often very good fliers – so they're usually some of the first creatures to arrive at new garden ponds. Water bugs of one kind or another should always be present in a good quality wildlife pond. They're not particularly sensitive to pollution, and some can live in the most unlikely of places including ponds with lots of bare polluted sediments, and no water.

Shrimps – In most garden ponds you will find a small introduced American species of shrimp called *Crangonyx pseudogracilis*.

The more familiar freshwater river shrimp *Gammarus pulex* does occur in ponds with inflowing streams and springs, but isn't very happy in most garden ponds. People believe that freshwater shrimps are good indicators of whether a pond is polluted or not. Actually this isn't true, they are quite tolerant of all sorts of pollutants, so they can live in good ponds and bad.

Pond skaters – You will find pond skaters on the surface of practically every pond in Britain. The common garden species are all good fliers which can move from pond to pond easily, and live on other insects on and just under the water surface. Pond skaters all look very similar to each other, but there are actually 10 different species found on ponds, lakes and even rivers in Britain.

Water Measurer © Adrian Chalkley

Pond Skater © Katie Fuller

Water Slaters – Water slaters are relatives of the familiar garden woodlouse, and are often found living in rotting leaves at the bottom of ponds. There are only two likely to be seen in Britain: the Common Water Slater (*Asellus aquaticus*) with two white spots on its head, and the more uncommon, One-spotted Water Slater (*Asellus meridianus*) which has only one. Water slaters cannot fly, and have to move to new ponds by hitching a lift. Despite this, they are one of the most common creatures found in garden ponds, in part because they are able to tolerate low oxygen levels.

Snails – There are about 40 different kinds of water snails in Britain, and you will find some in almost every pond. They vary in size when fully grown from the tiny Nautilus Ram's-horn, which is just 2 or 3 mm across, to the Great Pond Snail which grows up to 4 cm.

Common water snails are good at getting around from place to place. Most are probably carried by birds or amphibians, or attached as eggs to bits of introduced plant.

It's sometimes said that snails are important for keeping a pond clean. However, although snails will thrive in polluted ponds, grazing on the algae, in reality they are just recycling the nutrients.

Wigglies – Worms, fly larvae, leeches, flatworms and other worm like creatures tend to get lumped together as together as 'wigglies'.

Many of these animals are nature's hoovers, gobbling down rotting organic matter, or feeding on those that do. But the 'wigglies' are such a diverse group of animals that you can find just about every possible different way of living amongst them: from docile grazers to fierce predators.

ATTRACTING AMPHIBIANS AND REPTILES

COMMON FROG (*Rana temporaria*)

Probably the best known of the British amphibians, The Common Frog can be found in almost any habitat near suitable breeding ponds. Garden ponds are extremely important for Common Frogs.

Adult frogs can grow up to 9 cm long. They are usually olive-green or brown in colour, with a dark patch (or 'mask') behind the eyes, but can be yellow orange, red, green, brown and even blue, with blotches on their backs,and dark stripes on their back legs.

Often the first amphibians to be seen in the new year, spawning from January onwards, the tadpoles usually take around 3 to 4 months to metamorphose into tiny froglets, though some overwinter in this larval stage. 'Mature' frog tadpoles can be readily distinguished from toad tadpoles by their faintly speckled gold/brown colouration, where toadpoles are black. Frogs often hibernate at the bottom of ponds in soft mud, so be careful if you clear your pond out during the winter.

COMMON TOAD (*Bufo bufo*)

Despite its name, the Common Toad is no longer as common as it once was, and toads are now considered an 'at risk' species. Toads can be distinguished from frogs by their drier, and more warty skin, their very striking coppery eyes, and their habit of walking, rather than hopping. Both adults and tadpoles have glands in their skin containing powerful toxins which deter predators and are unpleasant to fish. As a result they are able to live undisturbed in fish ponds.

Toads usually only congregate in early spring for a week or so to breed, and then move away from ponds to resume a solitary lifestyle. Toadspawn is laid in strings or ropes (not clumps), the tadpoles taking around 3 months to metamorphose into adults.

Common toads are most active at night when they hunt their favourite foods, including snails, slugs, ants and spiders, and may remain in your garden for long periods over the summer. However, as temperatures drop in the autumn, they will start to look for somewhere to hibernate. You can encourage toads to stay in your garden by providing suitable hibernation structures such as a log pile, rubble piles, or man made structures like an old flower pot.

NEWTS

There are three species of newt in Britain: the Great Crested Newt (*Triturus cristatus*), the Smooth Newt (*Lissotriton vulgaris*) and the Palmate Newt (*Lissotriton helveticus*).

Over the last 100 years Great Crested Newts have disappeared from many sites across Britain and Europe, mainly as a result of pond loss and intensive agriculture, and they are now strictly protected under British and European law. Smooth newts are more common, and this is the species you are most likely to encounter in your garden pond. Palmate Newts are less frequently seen, because they prefer shallow ponds, on acid rich heathlands and woodlands. However, if you live near this type of habitat, then it is worth taking a second look, as you may be lucky enough to spot one.

Growing up to 15 cm in length, Great Crested Newts are the heavy weights of the newt world. They are dark brown or black in colour, with a 'warty' skin, and a bright orange underside with contrasting black blotches. In the spring, males develop an impressive jagged crest along their back, and a flashy white stripe along the tail.

The smaller Smooth Newt is light beige to olive brown in colour, with a yellow/orange belly speckled with small black spots (in both sexes). The males develop a continuous wavy crest along their back and on the top and bottom of their tail, during in the breeding season.

The Palmate Newt looks very similar to the smooth newt. The key differences are that they are slightly smaller, and lack the distinctive black throat spots. The male also has a long, bare filament at the end of his tail, and black webbing on his back toes.

Common Frog © Paul Lacey

Common Toad © Lorna Boustfield

Palmate Newt © David Orchard

During spring, male newts undertake an elaborate courtship display, with lots of extravagant tail waving. After mating, the females lay hundreds of individually wrapped eggs amongst the leaves of pond plants, and the young newts or efts begin to emerge from the pond in August.

All newt species come and go from ponds. The adult males arrive at their breeding ponds in the spring, and then start to leave from May onwards - though some may stay until as late as October, and even overwinter in the pond. By late September, they are looking for damp sheltered places to hibernate, like tree roots, burrows, and log or rubble piles. If you have newts in your garden then you can help them by providing some undisturbed hibernation places for them.

GRASS SNAKE (*Natrix natrix*)

Although found throughout England and Wales, Grass Snakes are declining nationally. Britain's longest snake, growing to a metre and sometimes more, in length, Grass Snakes are usually grey-green in colour, with a distinctive yellow to orange-red and black collar around the neck, and black markings down the sides of the body. This beautiful,and non venomous snake is extremely timid and will vanish rapidly if you disturb it. However, they are excellent swimmers, and like to come to garden ponds, particularly to hunt for fish and amphibians, which are favourite foods.

Grass snakes are Britain's only egg-laying snake. The females lay up to around 40 off-white, leathery eggs in June or July, in warm places, including garden compost heaps. The eggs hatch into miniature versions of the adults in the late summer months.

Male Smooth Newt © Fred Holmes

Great Crested Newt © Andy Harmer

Grass Snake © Jonathan Cranfield

FINDING OUT MORE

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Stubbs, A.E. and Falk, S.J. (1983). *British hoverflies*. An illustrated identification guide. British Entomological & Natural History Society, London.

USEFUL ORGANISATIONS

Amphibian and Reptile Conservation (ARC) 655A Christchurch Road, Boscombe, Bournemouth, Dorset BH1 4AP, Tel: 01202 391319, e-mail: enquiries@arc-trust.org, Web-site: www.arc-trust.org.

Amphibian and Reptile Groups of the UK (ARG UK) Contact details for regional groups can be found at: www.arguk.org.

British Dragonfly Society (BDS). British Dragonfly Society, 23 Bowker Way, Whittlesey, Peterborough, PE7 1PY. e-mail: bdssecretary@dragonflysoc.org.uk. Web-site: www.dragonflysoc.org.uk.

Environment Agency. Head Office: Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, BS12 4UD. Tel: 01454 624400; Fax: 01454 624409. Web site: www.environment-agency.gov.uk.

Pond Conservation c/o Oxford Brookes University, Gipsy Lane, Headington, Oxford OX3 0BP. Tel: 01865 483199/483114, e-mail: info@pondconservation.org.uk, Web-site: www.pondconservation.org.uk.

Royal Horticultural Society, 80 Vincent Square, London, SW1P 2PE, www.rhs.org.uk.

THANK YOU

World of Water

Pond Conservation would like to thank World of Water Aquatic Centres for its support in producing this booklet.

www.worldofwater.com

Pond Conservation
For life in fresh waters

Pond Conservation is the national charity dedicated to protecting the wildlife of our freshwaters: ponds, rivers, streams, lakes, ditches and wetlands. We give advice, carry out research, promote practical action and lobby policy makers to ensure that freshwater wildlife and habitats have a secure future.

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Web: www.pondconservation.org.uk

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Appendix 4

Batbox information pack

Bat Box Information Pack


© Andrew Dumbleton

Bats are amazing animals that are important to ecosystems in the UK and worldwide. We have 18 species of bat in the UK, all of which are protected under European law. Bat populations in the UK have declined dramatically over the past century due to persecution and habitat loss. However, a number of UK bat species have recently shown signs of population increases so there is hope.

Bat boxes are artificial roosts designed to provide bats with alternative resting places or to encourage bats into areas where there are few existing suitable roost sites. There are various designs of bat box; wooden boxes that you can make yourself, ready-assembled external boxes for buildings and trees, and even integrated bat boxes that can be built into walls.

Providing bat boxes can increase opportunities for roosting bats but it can take a while for bat boxes to be used regularly, particularly where a number of suitable alternative roost sites exist. Bat boxes can have an important additional function in encouraging interest and educating members of the public about bat conservation. The correct design and placement of boxes will help increase the likelihood of their uptake by bats.

Bat roost preferences

Bat boxes are now available from many outlets, and in a range of shapes and sizes, so some knowledge of what bat species are in your local area and their preferences will help you choose the best possible box. For example, some species such as horseshoe bats and grey long-eared bats do not use bat boxes.

Microclimate within a new roost is a very important factor in terms of increasing the chance of successful uptake by bats. In general, they prefer warm, dry spaces in the summer for rearing young and cooler damper spaces in the winter for hibernation. The box should be draught proof and made from a thermally stable material such as untreated wood, ecostyrocrete, woodcrete, brick or stone. If possible, it's better to provide several internal chambers so that the bats can move to where the conditions suit them best.


©Hugh Clark

Orientation and location

Structures for summer roosting should be positioned where they are sheltered from the wind but unshaded for most of the day. Summer maternity roosts (in the northern hemisphere) should be on a south-easterly to south-westerly aspect. It is always best to provide a number of different options for bats so that they can choose the most appropriate temperature based on their needs. This can be achieved by grouping a number of bat boxes each with a different aspect; two or three boxes is preferable to one, although a single box still has a chance of being used depending on the bat species that use the local area. Three boxes can be arranged around the trunk of larger trees – see below for details about putting up bat boxes.


© Fern Alder

Bat boxes are more likely to succeed in areas where there is a good mixture of foraging habitat, including trees, and a source of water (most maternity roosts are located within a short distance of permanent fresh water such as a stream, pond, river or lake). Bat boxes in areas with few other roosting opportunities are also likely to be more successful.

Bat boxes should also be located close to unlit linear features, such as lines of trees or hedgerows and no lit should fall on the bat box itself or the adjacent habitat. Bat species use dark linear features for navigation between their roosting sites and feeding grounds and to avoid predation by 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.

Size of the bat box

The most frequently used bat boxes are small, with narrow apertures to enter them and are only suitable for crevice-dwelling bat species.

Access

Crevice dwelling bats crawl into their roosts via small gaps around 15-20mm high. Roughened vertical surfaces or landing areas allow better access (by landing and crawling), horizontal landing perches should be avoided as these are not necessary, may even deter bats and encourage birds to nest within the bat box.


© John Altringham

Other considerations

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.

If possible, make or purchase bat boxes with an entrance slit along the bottom so that accumulated bat waste can drop out of the box or be pushed out as bats emerge. This will also help stop birds nesting in the box and blocking the entrance, which can happen with bat boxes that have entrance holes in the middle or entrances holes that are too large.

Boxes that may accumulate bat droppings will also need to be cleaned regularly by a licensed bat worker. It is important to remember that bat boxes must not be opened by anyone except a licensed bat worker (see 'monitoring bat boxes' below for more details on licences). In addition, nesting birds must not be disturbed so leave the area immediately upon finding an active nest in a box, and there is the potential for dormice to be found in some woodland boxes, in which case the box must only be checked by a licensed ecologist.

Types of bat boxes

Bat boxes come in many forms depending on their materials, function and location. Simple bat boxes are available commercially or can even be home-made. Bat boxes can be divided into the following categories: self-made external bat boxes, ready-made external bat boxes, integrated bat boxes and free standing bat boxes. Advanced forms of artificial roost creation include bat houses, bat barns and internal bat lofts (if you are interested in these please refer to the websites and publications listed at the end of this document).

Self-made external bat boxes

Self-made wooden bat boxes are usually located on trees or the outside walls of buildings. These boxes are usually cubic or rectangular, with a grooved 'bat ladder' and a narrow entrance slit at the bottom. These will last for approximately ten years and can either be bought in kit form, or you can make your own from scratch (there are instructions for the 'The Kent bat box' pictured below in the Appendix at the end of this document – these boxes are also available commercially).

They come in a variety of shapes but key requirements are:


Kent Bat Box

- While commercial wooden bat boxes may be made from a variety of materials, to make sure self-made bat boxes are suitable for bats we recommend the wood used should be rough sawn for grip and untreated.
- Bats do not like draughts; the entrance slit should be no more than 15-20mm wide and there should be no gaps where the sides and top join - the box should be well put together.
- A box that cannot be opened is best - it will lessen the chances of the bats being harmed through becoming trapped under the opened lid, or disturbed by people opening the top.
- To increase longevity of the box, use screws rather than nails.
- Any screws, hardware or staples used must be exterior grade (galvanized, coated, stainless, etc).

Ready-made external bat boxes

There are a number of ready made external bat boxes suitable for buildings and trees that can be purchased. These boxes can be made from wood, however there are an increasing number of more durable options, such as ecostyrocrete (pictured right). These types of boxes can come in a range of finishes to blend into the buildings façade or indeed to highlight their presence!

Integrated bat boxes

Integral or integrated bat boxes can be built into the walls or masonry of houses and other buildings.. The boxes can be embedded such that they do not impair the air-tightness of the building.

Many designs are available including some that have bespoke coverings that can match the building façade and / or highlight the boxes presence. The same principles for size, location and access apply.

©Green&Blue

Ready-made free standing boxes

American style bat houses (larger, multi-chambered boxes) have been successfully used for bat conservation in North America and elsewhere. These large multi-chambered boxes are increasingly being used in the UK for sites where there are few suitable features (such as trees or buildings) for boxes to be attached to, as they can be put up on poles:

http://www.batcon.org/files/RocketBoxPlans.pdf

The Roost Partnership scheme

The Roost Partnership is a unique conservation-lead built environment scheme involving BCT and bat box or access product manufacturers working together to provide bat conservation features that can be incorporated onto and into buildings and other structures that are designed with the latest best practice guidance and research in mind.

The Partnership doesn't endorse particular products but rather promotes the importance of our common goal of improving roosting opportunities for bats within our built environment. The Roost Partnership also acts as an information sharing hub used to gather feedback from industry professionals to constantly improve our understanding of bat roosting requirements. Details of companies and products within the Partnership scheme are found on the BCT website: https://www.bats.org.uk/our-work/buildings-planning-and-development/roost-replacement-and-enhancement/partnerships

Putting up bat boxes

Most bat species will use higher positioned boxes (around 4m up); assess the risk of working at height when undertaking the installation, then place the box as high as it is safe to do so. This will also help protect bats from vandalism and falling prey to cats. If working in the public realm, try to locate boxes so they are not above public walkways.

Ensure the boxes are appropriately fitted, to avoid the risk of them falling off. The boxes should be checked at least annually and after high winds to ensure they are still securely in place.

On buildings

Place the boxes high up by the eaves on a building, which can also help shelter the box from the weather. As detailed above, the aspect of the box should capture sun for part of the day if the intention is to attract maternity colonies.

Gazebos, garden walls and sheds have been suggested as sites for bat boxes. However, the main danger is that the boxes are not high enough above the ground, the structures may not be robust enough to support the box in high winds and the boxes are too visible to predators or vandals.

On trees

Consideration should be given to tree growth and boxes may need rehanging over time, regularly check boxes to assess this. Use headless or domed nails not fully hammered home to allow the tree growth, again regular checks will ensure that this allowance can be made while still being securely fitted. 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.

Monitoring bat boxes

Making and putting up bat boxes is a great conservation action but what is even more useful is to know whether they are being used, when and by which species.

How long before bats will use the box?

Sometimes it can take several years for bats to find a new box. Be patient! Slow (or no) uptake may be due to the availability of other roosts locally. Sometimes, however, bats move in within months or even weeks!

How will I know if the box has been successful?

To check if the box is being used, look out for droppings and urine-staining on the vertical 'bat ladder' below the box and listen for 'chattering' during the day, especially during the summer months. You can also watch the box for an hour either side of sunset to observe any bats leaving to feed, or around dawn to see any bats returning to their roost. Bats may be observed by looking up into the box from below, however no light should be used as this may disturb any bats that are present.

Licensing and the law

You can undertake the non-invasive checks above without needing a licence. However, if the box needs to be opened to check it then there must be a suitably licensed bat worker present. Anyone wishing to undertake bat box checks should obtain training in bat handling and identification before applying for a licence. You can find out more about licensing and bats on the Bat Conservation Trust website at: www.bats.org.uk/pages/licensing.html

All bats and their roosts are protected by law and it is an offence to deliberately disturb, handle or kill bats. The relevant legislation in England & Wales is the Wildlife and Countryside Act 1981 and Conservation of Habitats & Species Regulations 2017. In Scotland it is the Conservation (Natural Habitats, etc.) Regulations 1994 and in Northern Ireland the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995.

A bed without breakfast?

Bats often use features such as hedgerows, tree lines and watercourses as commuting pathways between roosts and foraging areas. This type of habitat also provides shelter, allowing insects to gather and therefore supports foraging bats. The highest densities of bats occur where insects are most plentiful.

Make sure you maintain or create good foraging habitats for bats by planting a wide range of plants such as flowers that vary not only in colour and fragrance, but also in shape. See BCT's 'Encouraging Bats' leaflet for more information (www.bats.org.uk\publications).

Useful websites

Bat Conservation Trust www.bats.org.uk
The Bat Conservation Trust (BCT) is working towards a world where bats and people thrive in harmony, to ensure they are around for future generations to enjoy. BCT is the only organisation solely devoted to bat conservation in the UK.

Bat Conservation International www.batcon.org
Bat Conservation International's mission is to conserve the world's bats and their ecosystems to ensure a healthy planet. Based in Austin, Texas, BCI is devoted to conservation, education and research initiatives involving bats and the ecosystems they serve.

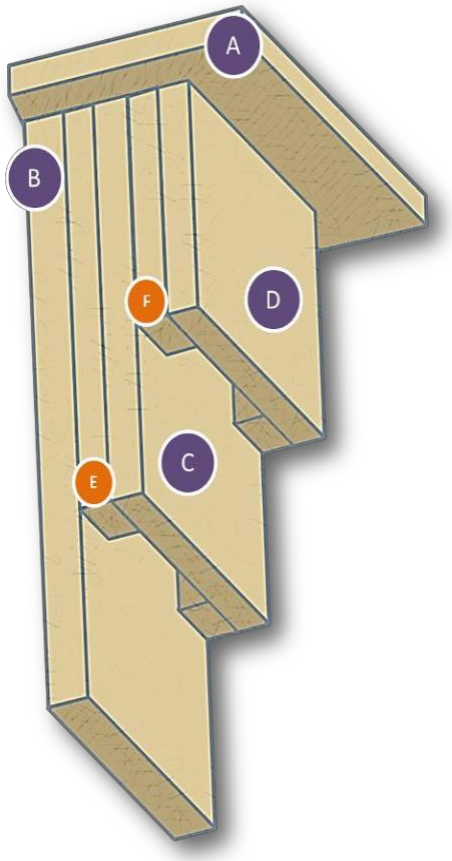
Vincent Wildlife Trust www.vwt.org.uk
The Vincent Wildlife Trust (VWT) is an independent charitable body founded by Vincent Weir in 1975 and has been supporting wildlife conservation ever since. They conserve a range of endangered mammals through management of their own reserves, undertake pioneering research and provide expert advice to others through practical demonstration.

Publications

- Gunnell, K., Murphy, B. and Williams, C. (2013) Designing for biodiversity: a technical guide for new and existing buildings (2nd ed.)
- Gunnell, K., Grant, G. and Williams C. (2012) Landscape and urban design for bats and biodiversity
- Mitchell-Jones, A.J (2004) Bat mitigation guidelines
- Mitchell-Jones, A.J. and McLeish, A.P. (2004) Bat workers' manual (3rd edition)
- Tuttle, M.D., Kiser M. and Kiser S (2004) The Bat House Builder's Handbook

Appendix: The Kent bat box (D.I.Y. instructions)

Design and measurements



Simple to construct, self-cleaning and low maintenance, the Kent bat box (designed by the Kent Bat Group) is a great way to encourage bats in your garden or your green space. The box should be rainproof and draught-free.

The only critical measurement is the width of the crevices: between 15-25mm. Other measurements are approximate. Timber should be approximately 20mm thick.

Measurements for one Kent bat box kit would be as follows:

Part	Quantity	Size (mm)
Roof (A)	1	x 160 x 20
Back (B)	1	x 200 x 20
Centre (C)	1	x 200 x 20
Front (D)	1	x 200 x 20
Centre Rails (E)	2	x 20 x 20
Front Rails (F)	2	x 15 x 15
Stand-offs (optional)	2	x 20 x 20

Material and Tools

This kit requires approximately 1.6m of rough wood and 25 screws (8 x 1 ½ inches) to assemble. You can rough it up by scraping with a suitable tool – possibly a saw blade or even a screwdriver but make sure you use untreated wood as some preservative chemicals can kill bats.

Pre-drill the holes to prevent the wood splitting. Alternatively you can assemble your bat box kit with nails although they tend to be less robust than boxes made with screws.

The hanging screws may either be at the edges of the front panel or in the side centre block (not in the rails!). Fixing may be by use of brackets, durable nylon cord or wires.

When installing the box, assess the risks of working at height, use the appropriate fittings and assess where the box will be located, in relation to any public access. Regular checks should be made to ensure the box remains securely fitted, especially after high winds.

Photos and illustrations in this document by the Bat Conservation Trust unless otherwise stated.

Appendix 5

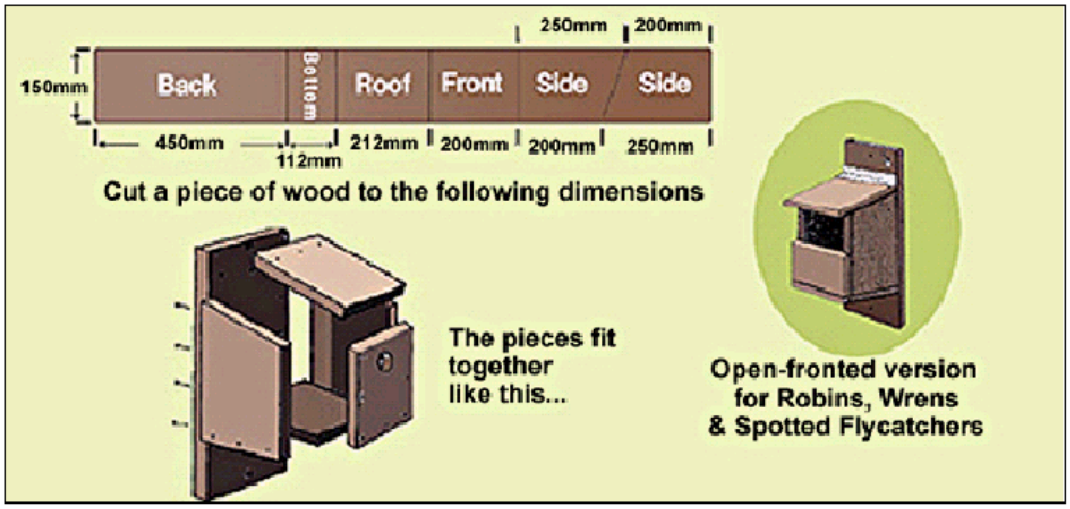
Nestbox factsheet

Nestboxes

Although you may have plenty of birds coming into your garden to feed, there may not be anywhere suitable for them to nest. Modern houses have few holes or crevices for nesting, and old trees, which may have suitable holes, are often felled. Nestboxes provide the ideal solution and make excellent substitutes for natural nest sites for hole-nesting birds. They can be designed to suit the requirements of a range of different species, but the most popular are the ones which have an entrance hole suitable for the members of the tit family.

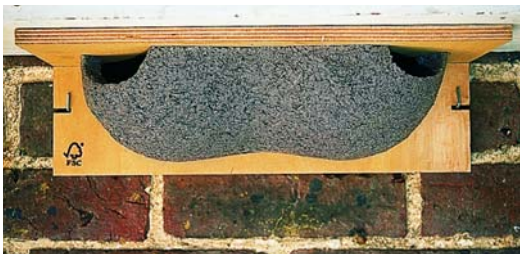
Building a nestbox

For the usual hole-nesting type of box use a plank about 150mm wide and 15mm thick: see the diagram below. Bear in mind that the inside of the box must be at least 100mm square and the bottom of the entrance hole must be 125mm from the floor. If it is less, young birds might be scooped out by a cat. Hinge the lid with a strip of leather or rubber (a piece of old inner tubing from a bicycle tyre would be perfect for this).



When constructing the box, use screws instead of nails if you can; galvanised nails are better than wire ones. A good catch to fasten the lid is essential. Wood preservative applied each autumn will prolong the life of the box. Ideally, a brace and bit should be used to drill the entrance hole, but if this is not possible you could use a fretsaw instead. By altering the size of the hole you cut you can determine which species will be most likely to use the box. The following is a guideline to which size holes certain species generally prefer (hole size given in mm): Blue Tit (25mm), Coal Tit (25mm), Great Tit (28mm), Tree Sparrow (28mm), House Sparrow (32mm), Starling (45mm).

Make the same box with the upper half of the front taken away altogether for Robin, Pied Wagtail and Wren. Spotted Flycatchers prefer a somewhat shallower open-fronted box. Some other species will use specifically designed nestboxes or platforms, including Swift, Swallow, Dipper, Grey Wagtail, Kestrel, Barn Owl, Jackdaw and Treecreeper; for further details of how to construct boxes suitable for these birds please contact BirdWatch Ireland.



BirdWatchIreland
protecting birds and biodiversity

When & where to put up your nestbox

Put your nestbox up well before the start of the breeding season, as many birds begin searching out nest sites from February onwards. Don't be too disappointed if nothing uses the box in the first year or two. Ideally the box should be located at least 2m from the ground (preferably 3 - 5m) to ensure that cats and curious people can't disturb or look into the nestbox. Place the nestbox on a wall, fence or tree trunk away from your bird table and in a quiet area. Do not nail a box to a tree but instead use a wire strap, and remember to check it every year to ensure the wire isn't cutting into the tree trunk as it grows. It is best to have the box angled forward slightly and kept away from the wall or tree by a strip of wood.

Unless the site is very sheltered the box should be fixed facing between north and south-east to avoid the hot sun and the wettest winds. There is no hard and fast rule as to how many nestboxes to put up, because it all depends on the surroundings, but for Blue and Great Tits a density of 2 to 4 boxes per acre would generally be enough. In all but the largest gardens only one box of each type is likely to be used, perhaps one by tits and one by Robins. On the other hand, two nestboxes quite close together are sometimes occupied at the same time if they are both at the edge of a territory. Also, take care not to put a box too close to a bird table. If you have to, because your garden is small, then stop putting out food once birds show interest in the box; otherwise they will spend all their time chasing other birds attracted to the food, and may eventually give up trying to nest altogether.

Care of your nestbox

If birds take up residence in your nestbox you should resist the temptation to keep having a quick peep, as this could potentially result in the parents abandoning the nest. Instead, watch the comings and goings of the birds from the safe distance of your kitchen window: they will behave more naturally and you will enjoy and learn more this way. 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 (which should kill most parasites that may be lying in wait, ready to infest next year's brood). In cases of severe parasite infestation it may be necessary to use one of the less harmful insecticides, such as pyrethrum powder, but this should be avoided unless thought absolutely necessary.

A small handful of wood shavings placed in the box may encourage some birds to roost in it during the cold winter nights. Don't use straw as this will get damp and turn mouldy in the box over the course of the winter.

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Why do some garden birds lay so many eggs?

In the natural world only the strongest individuals survive. Many bird species lay a surprisingly large number of eggs (for example, Blue Tits and Great Tits can lay as many as 14 or more in a single clutch), but the survival of all these chicks would be almost impossible, due to the limited food supply and to the natural tool taken by predators and disease. By laying so many eggs, the adults can ensure that at least some of their offspring will survive to breed the following year.

Why, when I came to clear out the old nest, did I find a number of young birds dead inside? Why did the birds desert the nest with eggs/young?

The main reason that parent birds desert their nests is because they have felt threatened by predators. The list of potential predators of nestboxes include cats, squirrels, rats, mice, stoats, and members of the crow family. Nestboxes can be afforded some protection against squirrels by fixing a metal plate around the entrance hole. If the box is fastened to a tree it may be kept free from cats by winding barbed wire loosely round the tree beneath it.

Alternatively, bundles of gorse tied round the tree above and below the box offer protection from most mammalian predators. Do not have a perch on the nestbox; it is of no use to the nesting birds and simply gives predators easier access to the eggs or chicks inside. Humans can also cause a nest to be abandoned, so please do try to resist the urge to peek inside the boxes and only remain in the immediate vicinity of a nestbox for a few minutes at most.

A sudden onset or a prolonged spell of cold weather in the late spring can also lead to the death of chicks, and nests are frequently abandoned in such conditions. This is generally due to lack of suitable natural food for the young or the death of one of the parents.

Why do the tits hammer at the entrance hole?

This is probably partly an instinctive action in natural sites where the entrance of the nest hole may need enlarging, and the behaviour may occur even in nestboxes where it is not necessary. It could also be part of the tits' constant search for small insects.

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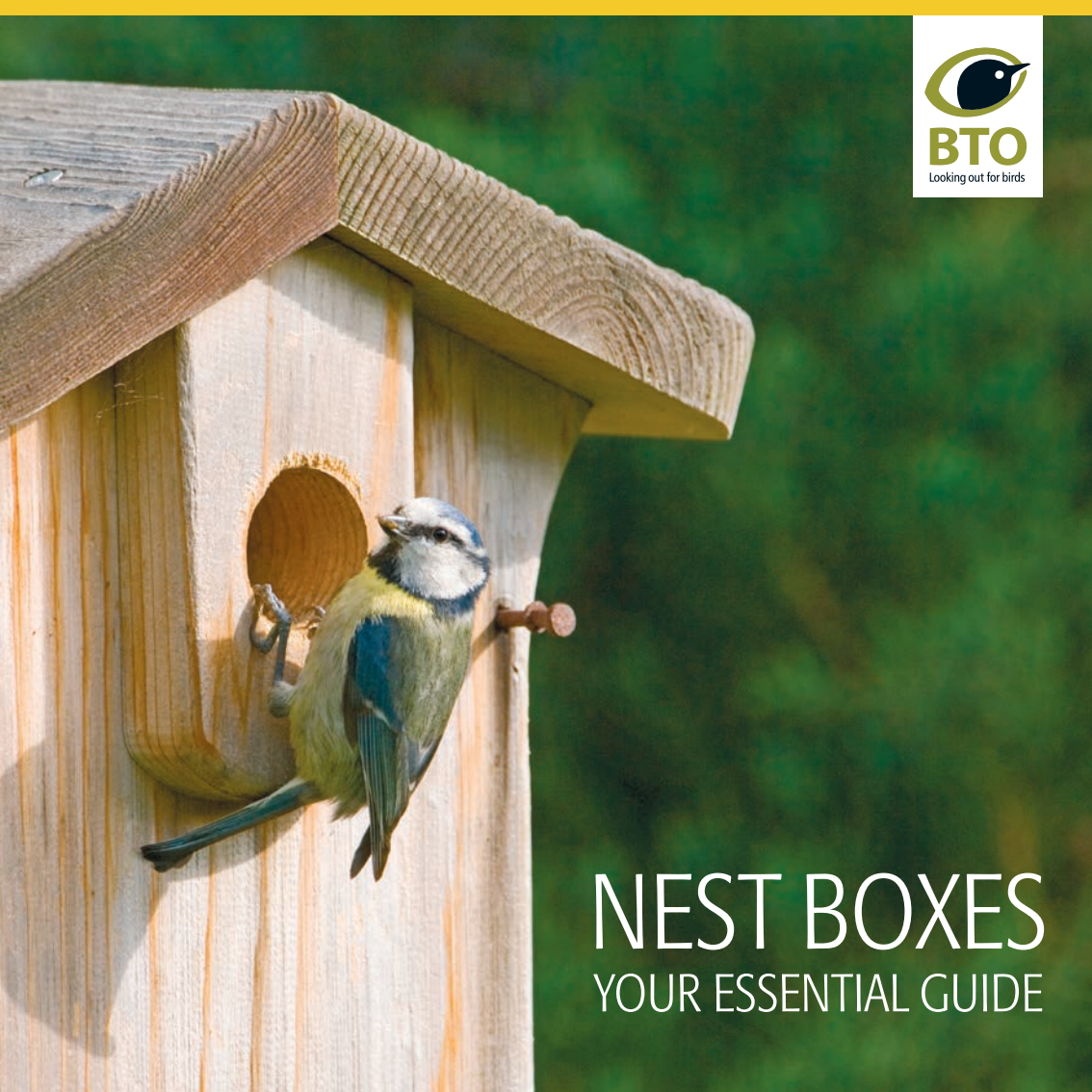
Appendix 6

BTO nestboxes essential guide


BTO
Looking out for birds
NEST BOXES
YOUR ESSENTIAL GUIDE

WHY WE NEED NEST BOXES

The loss of hedgerow trees, changes to woodland management and increasing urbanisation have all contributed to a decline in the availability of natural sites for cavity-nesting species like Blue Tit and Starling. Species that nest alongside people, such as House Sparrow and Swift, have lost out to changing building regulations, which have reduced the opportunities for birds to nest under roof tiles or in holes in barge boards.

Well-designed nest boxes can replace these lost opportunities, increasing the numbers of nesting birds and boosting their populations, while providing the opportunity to collect valuable data. This guide provides the essential information that will enable you to find or build the right nest box for your garden, so you can do your bit to help our breeding birds.

PIED FLYCATCHER CHICKS, MIKE TOMS / BTO

MATERIAL

Boxes should be made of waterproof insulating material, such as wood or 'woodcrete'. Boxes made from thin wood, plastic, metal or solid ceramic may overheat, which is dangerous for birds.

OPENING ROOF

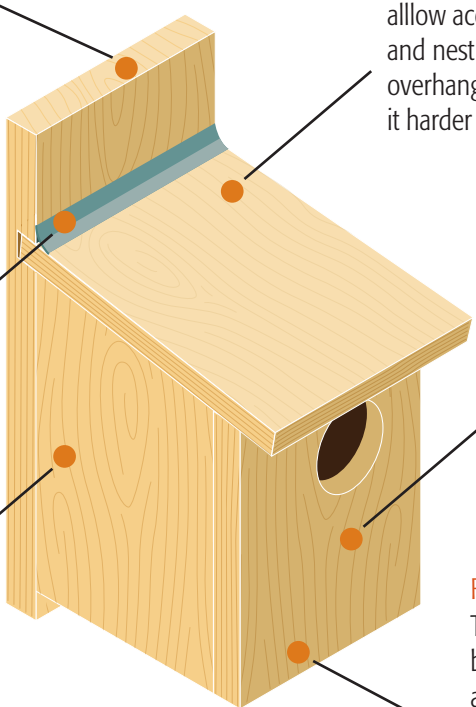
A roof that can be lifted will alllow access for cleaning and nest monitoring. An overhanging roof will make it harder for cats to reach in.

WATERPROOF

Make sure that water cannot get into the box where the roof is fixed.

HOLE LOCATION

The hole should be at least 12 cm above the floor of the box to prevent predators reaching in.



WALLS

Box walls should be at least 15 mm thick to provide adequate insulation.

FLOOR SIZE

The inside cavity should be a minimum of 15 cm across, and the floor should have small drainage holes in case water gets in.

Boxes should ideally look natural or inconspicuous.

BUYING A NEST BOX

With lots of different nest box designs on the market it can be difficult to decide which is the best one to purchase. The first thing is to think about the species that you wish to attract, since different species have different requirements. You'll discover more about this later in this guide.

There are some things that all good nest boxes will have, and you should look for these when purchasing a box (see diagram). There are also some things that you should avoid, most notably poorly-made boxes and those where the nest box is built into the roof of a bird table. Placing a bird box close to a bird table – or building it within the roof of the table – is a bad idea, reducing the chances that it will be used.

Avoid boxes that have a perch on the front; nesting birds do not need a perch and its presence makes it easier for predators to gain access.

BUILDING A NEST BOX

Making you own nest box is fun and rewarding. Wood is the best material to use. Soft woods, such as pine, are easy to cut and the natural resins ensure a long life. Hard woods, such as oak, will also be weather resistant but are hard to cut and may warp under certain conditions. Choose wood that is at least 15 mm thick.

Your basic tool-kit for making boxes will contain a handsaw, hammer, screwdriver, drill and drill bits. If you are using a rubber hinge to attach the roof then a heavy duty staple gun is useful. Use screws or nails to make the box, with glue used to provide additional strength.

Don't forget to drill drainage holes into the base and pre-drill holes in the back plate to allow attachment to a tree or building. It is important that the hinged roof can be opened easily for cleaning out the box at the end of the season and for monitoring visits. Use a water-based preservative on the outside of the box and leave the inside bare. There is no need to add any lining to the box.

MAKING A NEST BOX. MIKE TOMS/ BTO

BLUE TIT NEST BOX

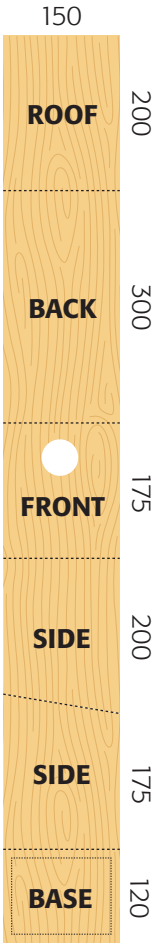
The Blue Tit is a familiar species that makes ready use of nest boxes placed within gardens, parks and woodland sites. A standard, small hole-fronted nest box, with an entrance hole of 25 mm diameter, works best for this species.

Although a Blue Tit may use a box with a larger entrance hole, there is the risk that it will be kicked out by a larger and more dominant species, such as Great Tit. Blue Tits are single-brooded, with most eggs laid during April and May.

Blue Tit boxes are best placed within suitable woodland habitat or a garden setting with a suitable tree or other structure onto which the box may be fixed. Avoid obvious sun traps, such as south-facing walls, and ideally place the box so that the entrance hole is facing north-east.

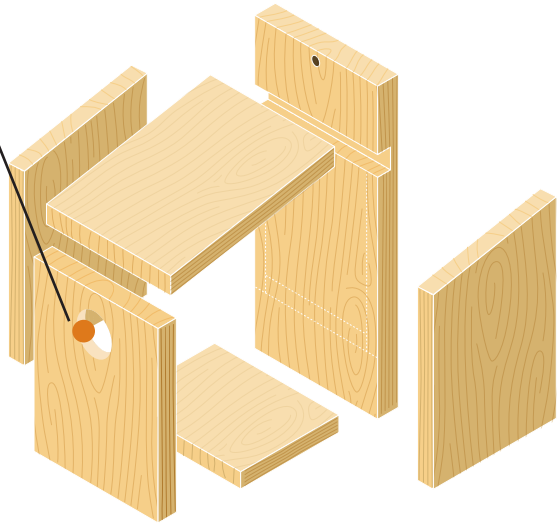
The box does not need to be positioned within cover, as Blue Tits like to scan for predators before leaving the box. Position the box 2–3 metres off the ground, higher if you think there is the risk of disturbance.

Plank size *c.* 150 x 1170 mm All measurements are in mm



25 mm diameter for Blue Tit (and Coal Tit)

Exploded view showing how the box goes together



BLUE TIT, EDMUND FELLOWES / BTO

Blue Tit *Cyanistes caeruleus*

Clutch size: 8–10 eggs
Incubation: *c.* 12 days
Chicks fledge at: 16–22 days
Broods: 1 per year

Seasonality of nests with eggs (E) and young (y), derived from Nest Record Scheme data.

HOUSE SPARROW NEST BOX

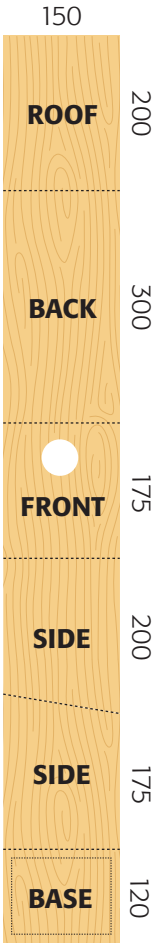
The loss of suitable nest cavities appears to have played a role in the decline of this familiar species, so the provision of one or more nest boxes is something that you can do to help.

A standard, small hole-fronted nest box, with an entrance hole of 32 mm diameter, works best for this species. House Sparrows may make two or three breeding attempts during the breeding season.

House Sparrow nest boxes are best placed so that the entrance hole is facing north-east and is sheltered from the prevailing wind and rain. Avoid obvious sun traps, such as south-facing walls. The box does not need to be positioned within cover. Position the box 2–3 metres off the ground, higher if you think there is the risk of disturbance.

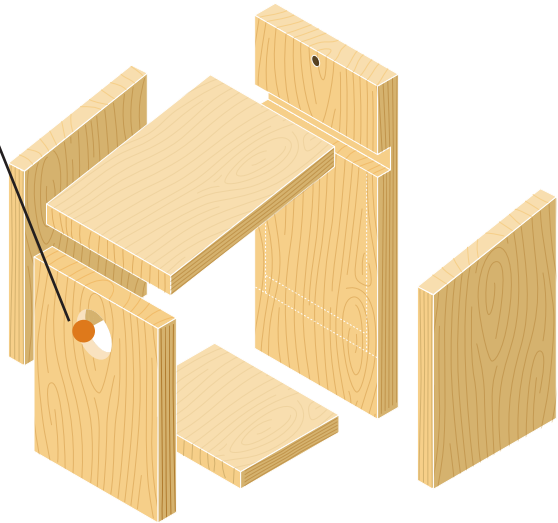
House Sparrows are colonial breeders, so consider placing several boxes in close proximity. Some people have found that leaving a piece of straw poking out of the entrance hole of a new box can encourage its use by House Sparrows.

Plank size *c.* 150 x 1170 mm All measurements are in mm



32 mm diameter for House Sparrow

Exploded view showing how the box goes together

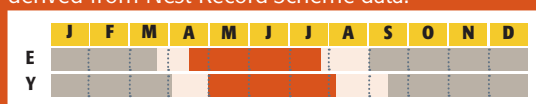


HOUSE SPARROW, JOHN HARDING / BTO

House Sparrow *Passer domesticus*

Clutch size: 4–5 eggs
Incubation: *c.* 12 days
Chicks fledge at: 14–15 days
Broods: 2–3 per year

Seasonality of nests with eggs (E) and young (y), derived from Nest Record Scheme data.



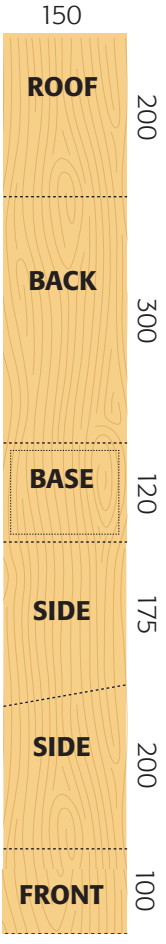
ROBIN NEST BOX

The familiar Robin is highly adaptable when it comes to nest sites, taking advantage of a wide range of opportunities. Nearly all of the sites used will involve some hole, hollow or recess and the species will readily take to a suitable nest box of the 'open-fronted' design.

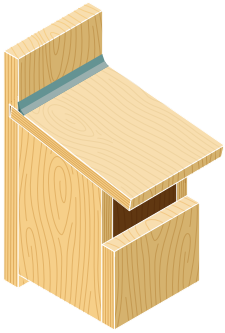
Robins are incredibly wary around the nest and will avoid entering the nest site if they suspect that they are being watched, both when building the nest and when feeding the chicks. Nest boxes are often re-used in successive years.

Robin nest boxes are best placed so that the entrance hole is facing north-east and is sheltered from the prevailing wind and rain. Avoid obvious sun traps, such as south-facing walls.

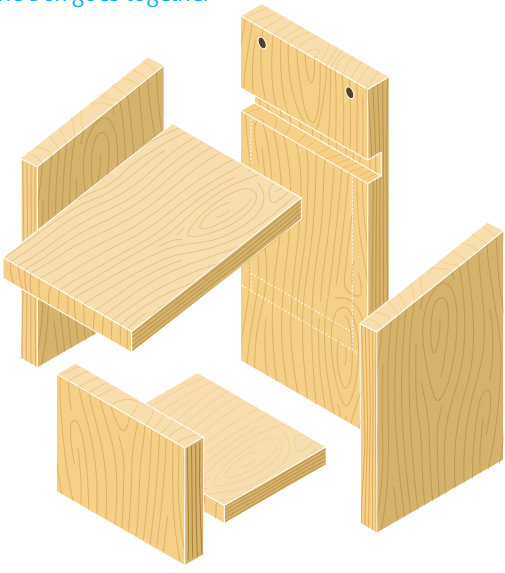
The box should be placed within the cover of a climber or overhanging vegetation. Robins typically nest quite low, usually less than 2 metres off the ground, but can nest much higher.



Plank size *c.* 150 x 1095 mm All measurements are in mm



Exploded view showing how the box goes together



ROBIN, EDMUND FELLOWES/RSPB

Robin *Erithacus rubecula*

Clutch size: 4–5 eggs
Incubation: 13–14 days
Chicks fledge at: 13–14 days
Broods: 2 (3) per year

Seasonality of nests with eggs (E) and young (y), derived from Nest Record Scheme data.

MONITORING YOUR NEST BOX

Putting up a nest box is very worthwhile, but you can increase its value by recording how it is used. This is known as nest monitoring and is something that is coordinated through the BTO Nest Record Scheme. Information on nesting birds – such as the number of eggs laid and chicks reared – is essential if we are to understand why bird populations change and how they are affected by, for example, a changing climate.

BTO Nest Recorders provide this valuable information for the nests of a broad range of bird species. Nest Records from gardens are needed to help us understand the impacts of urbanisation.

You can find out more about the BTO Nest Record Scheme via the BTO website (www.bto.org) and there is a particularly helpful 'starter pack' that you can request.

YOUNG CHICKS, MIKE MAINWAIRING / BTO

LOOKING AFTER YOUR NEST BOX

Nest boxes should be cleaned out annually, between 1 September and 31 January. Be aware, however, that birds may occasionally breed particularly early or late in the year, so do check the nest contents first.

Removing old nests may be beneficial for nesting birds as it can reduce the number of nest parasites (such as fleas) present the following breeding season.

The use of a water-based preservative on the outside of the box – leave the inside bare – can help to extend the life of a box. You may find that you need to use the preservative every few years.

DAVID TIPLING / BTO

GETTING MORE INFORMATION

Much of the information presented in this short guide is taken from the BTO publication 'Nestboxes: your complete guide', which is available from BTO. This 162 page book contains step-by-step instructions for constructing nest box designs for a broad range of species, from tits and sparrows to owls, Kestrel, Swift and House Martin. It also contains a section on wildlife gardening.

The cutting plans provided in this guide are also available – with more detail – as downloadable PDFs from www.bto.org.

You can find a wealth of information about nest boxes and the birds themselves on the BTO website. There are pages with information on status, breeding ecology and movements, together with identification videos that you can use to improve you identification skills. If you have a query regarding birds then contact us by email (info@bto.org), phone (01842-750050) or post (BTO, The Nunnery, Thetford, Norfolk, IP24 2PU).

STARLING, SARAH KELMAN / BTO

DOING MORE IN YOUR GARDEN

There is so much that you can do to make your garden wildlife-friendly. In addition to providing nest boxes, you can plant flowers, shrubs and trees that are good for wildlife, providing a source of berries and seeds. The BTO has produced various guides and articles on wildlife-friendly gardening, and there are plenty of resources available online too, at www.bto.org

You can also make a significant contribution by participating in one of the BTO's garden-based 'citizen science' surveys. The biggest of these is the weekly BTO Garden BirdWatch scheme, through which several thousand homeowners chart the changing fortunes of birds and other garden wildlife. Find out more at www.bto.org/gbw

BTO science is telling us more about gardens and the wildlife that they contain. By participating in the BTO's work you can make a difference for birds and other garden wildlife.

GARDEN BIRDWATCHERS, PAUL STANCLIFFE / BTO

DOING MORE IN YOUR GARDEN

As well as visiting gardens to nest, many birds are attracted by the food available at garden feeding stations. While this food is virtually never used to feed chicks in the nest – most songbirds feed their young on insects and other invertebrates – it is a valuable resource for newly independent young once they have fledged.

Research shows that gardens do not hold the densities of insects that are seen in woodland habitats, and this can make it difficult for small birds to find sufficient numbers for their chicks. By taking a wildlife-friendly approach to your gardening, perhaps by planting suitable bushes and flowers, you can help to improve things for parent birds, busy searching for insect prey.

By continuing to provide suitable seeds in your feeders, such as sunflower hearts, you will be helping to feed adult birds during the breeding season, freeing up more insects for their chicks.

ROBIN, JOHN HARDING/ BTO

BTO is an independent charity. We seek to understand more about birds with the help of our members and volunteers.

Our goals are to:

- enable more people to participate;
- deliver impartial and relevant science;
- inspire and empower.

Find out more about joining our community.

www.bto.org/join

BTO
Looking out for birds

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Registered Charity Number 216652 (England & Wales), SC039193 (Scotland).

PHOTO CREDITS: Cover photograph by David Tipling. Nest box artwork by Nigel Hawtin

Appendix 7

Local communities actions to help pollinators

Online edition: ISSN 2009-6852
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National Biodiversity Data Series No. 4.

Local Communities:

actions to help pollinators

www.pollinators.ie

Guidelines 1

National Biodiversity Data Centre

Local Community projects can play a leading role in implementing the Pollinator Plan

Most people appreciate the beauty wildflowers bring to our landscape, they want the option to grow their own fruits and vegetables, and they want to buy affordable Irish apples or strawberries in our shops. This can only happen in a landscape that supports pollinators and provides them with nesting areas and a diverse diet from spring to autumn. If we choose to manage our local communities in a highly manicured way, it is at the expense of pollinators who cannot survive there. Local communities can lead the way in driving a better and more sustainable balance and bringing more natural, flower-rich pockets back into our landscape.

These guidelines are aimed at all those groups who are interested in making their local community more pollinator friendly e.g., Tidy Towns, Keep Northern Ireland Beautiful, Entente Florale, Green Communities, youth groups, local wildlife/environmental groups, PURE mile groups, community gardens, historic graveyard groups, college campuses, residents associations.

Suggested citation: Local Communities: actions to help pollinators. All-Ireland Pollinator Plan, Guidelines 1. National Biodiversity Data Centre Series No.4, Waterford. April, 2016.

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An Chomhairle Oidhreachta
The Heritage Council

Bord Bía
Irish Food Board

Department of Agriculture, Food and the Marine
An Roinn Talmhaíochta, Bia agus Mara

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Why Do We Need To Help Our Pollinators?

Farmers

Farmers who grow pollinator dependent crops like apples, strawberries or oil seed rape need pollinators to ensure reliable yields of high quality produce. Without them the livelihoods of farmers will be impacted. For consumers, this means it would be more difficult to buy local produce at an affordable price.

The value of pollinators to apples in Northern Ireland is worth £7 million pounds per year

Gardeners

We need a wide range of pollinator dependent fruit and vegetables to have a healthy diet. Until now we have had the option of growing our own fruits and vegetables to feed ourselves and our families if we wish. Without pollinators this ability could be lost to us and future generations.

Environment

Pollinators play a key role in our natural environment. 78% of our wild plants require insect pollination. Without these wildflowers, the landscape, cherished by us and crucial to our tourism sector, would be a less beautiful and colourful place. These plants provide food and shelter for our birds and mammals, as well as habitats for other animal populations, including many beneficial insects that attack crop pests.

Who Are The Pollinators In Ireland?

While other insects play a role, most pollination of crops and wild plants on the island of Ireland is carried out by bees.

There are 98 different species (types) of bees in Ireland. We have one honeybee, 20 different bumblebees and 77 different solitary bees. Bumblebees and solitary bees are known as wild pollinators. Research tells us that if we want our crops and wild plants to be pollinated we need an abundance and diversity of wild pollinators as well as healthy honeybees.

Unless you threaten them, bees will not attack humans. They are only interested in gathering nectar and pollen to feed themselves and their families. If a bee comes close to you just sit still and it will fly off when it realises you're not a flower!

20 + 77 = 97 Wild bee species

Only **1** Honeybee species

Bumblebee species

Solitary bee species

Solitary bees can be very efficient pollinators. One Red Mason solitary bee can do the work of between 120-160 honeybees.

Honeybee

Honeybees live in hives and are looked after by beekeepers. Beekeepers make sure the honeybees are healthy and have enough to eat, especially over the winter months. Honeybees are the only type of bees in Ireland who make honey.

Bumblebees

Bumblebees have fat, furry bodies. They are very important pollinators of crops like strawberries and tomatoes. Bumblebees make their nests on the ground, hidden in long grass or other vegetation. Like honeybees, bumblebees live in a colony with a queen, female workers and males. Queen bumblebees hibernate over winter and emerge in spring to begin their colony. To survive, it is vital that bumblebees have food from spring through to autumn. In late summer-autumn mated new queens need to fatten up before going into hibernation, while all the other bumblebees, including the old queen, die off.


Bumblebee © Sylvia Hetherington

Solitary bees

Solitary bees nest in tiny burrows that they make in bare soil or in cavities like holes in wood or hollow stems. Solitary bees exist as a single male and female. They emerge from hibernation in spring and make a nest. After mating, the female lays fertilised eggs and leaves a food supply of pollen beside each one. When this job is done the females and males die. The eggs hatch and the larvae eat the food supply left by the parent before overwintering in a cocoon to emerge the following spring.

Most solitary bees in Ireland are mining bees who nest in south or east facing slopes of bare earth (soil, sand, clay, peat)


Solitary bee bank © Una FitzPatrick


Solitary bee © Steven Falk

Pollinator Declines

One third of our 97 wild bee species are threatened with extinction in Ireland. We are also seeing declines in honeybee numbers. Bees are declining because we've drastically reduced the areas where they can nest and the amount of food our landscape provides for them. We've also inadvertently introduced pests and diseases that negatively impact their health, and we subject them to levels of pesticides that make it difficult for them to complete their life cycles.

What Can We Do To Help Our Pollinators?

If we want pollinators to be available to pollinate our crops and wild plants for future generations we need to manage the landscape in a more sustainable way and create a joined-up network of diverse and flower-rich habitats. It requires all of us to help from farmers to local authorities, to schools, gardeners and local businesses. These guidelines explain how local communities can lead the way in making Ireland more pollinator friendly.

All-Ireland Pollinator Plan

The All-Ireland Pollinator Plan 2015-2020 is supported by 68 governmental and non-governmental organisations who have pledged to deliver 81 actions to make the island of Ireland more pollinator friendly. At its core it is about making the landscape a place where pollinators can survive and thrive. The actions that are suggested through the Pollinator Plan will have a positive impact on biodiversity in general.

www.pollinators.ie

Local communities: actions to help pollinators


Volunteers at Moneypenny's Lock © Heather Crawford

Providing food, shelter and safety

To help pollinators we need to ensure that they have food, shelter and safety from chemicals. The actions suggested will provide this in your local community. The more of these actions you can take the better.

Many pollinator friendly actions simply require us to manage the land in a different way than we have become used to. It is not about letting the landscape go wild, but about managing it in a more sustainable way so that pollinators can survive and continue to provide us with their vital service.

We have suggested actions that are not costly and in some instances may lead to cost savings. Multiple actions are suggested so that you can consider your own local community and decide which actions would work best and at which location. In all cases, public health and safety should be the key consideration.

"Protect pollinators so that you can grow your own fruit and vegetables, shop for local produce and have flowers and wildlife in your local landscape"

Food and shelter

A Identify and protect existing areas that are good for pollinators

Most local communities will already have some areas that are very good for pollinators and are acting as refuges in an otherwise inhospitable landscape. The most important thing you can do is to recognise and protect these.

Action 1:

Protect existing sources of food and shelter for pollinators

Where these exist, you should protect them in your local area: flowering hedgerows (food), patches of wildflowers on waste ground (food), small wild areas with bramble/ivy (food), existing earth banks (shelter), dry stone walls (shelter).

- Signage can be used to identify to the public areas within the local community that are important for pollinators.

Food

B Reduce the frequency of mowing of grassy areas

If you have areas of grass, reducing the frequency of mowing allows common wildflowers such as Clovers, Knapweed and Bird's-foot-trefoil to naturally grow amongst the long grass. This is the most cost-effective way to provide food for pollinators and other insects.

The following suggested actions (2-4) can be carried out side-by-side, transforming a large expanse of green grass to a mosaic of flowering areas of different heights. If the original grassed area is used for sports or picnicking, identify which parts are used in this way and retain these as short grass, framing them with the pollinator areas.

Info Box:
the use of fertilisers encourages grass growth and should be avoided if you want to gradually create a flower rich meadow

Note: there will be areas in your local community where it is not appropriate to have long grass due to health and safety concerns about littering or dog fouling. You should also avoid having long grass on verges that the public use for walking or running.

Info Box:
School groups, community groups or Mens's Sheds groups could get involved in making signage

Areas where these actions might apply in a local community are: parks, roadside verges, pavement verges, greenways, roundabouts, off-road walking/cycle routes, waterway towpaths, housing estates, school grounds, hospital grounds, old graveyards. In some cases it might involve working with local authorities or relevant NGOs.

Action 2:

Reduce mowing and aim to create a wildflower meadow

Meadows managed in the following way will allow wildflowers to bloom throughout the pollinator season. A further benefit is that bumblebees are provided with an undisturbed area for nesting. Over a number of years, the area will become more and more flower-rich with local species that are adapted to the site's conditions – all without spending money on wildflower seed!

1. Identify areas in the local community where it may be possible to allow a grassy meadow to grow
2. Wait until April to do the first grass cut - this allows the first flush of Dandelions
3. During the summer, let the grass grow long, perhaps cutting paths through the middle or keeping a short border at its edge to make it look tidier and allow the public to enjoy the resource
4. Cut again in early September. However if the grass growth is very strong and the vegetation is falling over under its own weight, cut sooner e.g. July and again in September. After a few years as soil fertility is lowered, this earlier cut will no longer be necessary and one cut at the end of the summer will be enough
5. The grass cuttings should be removed after each cut to reduce soil fertility over time. If the area is large and accessible to a tractor it can be baled for hay or haylage. Otherwise rake it off the meadow area and compost it or use it as mulch or dispose of it as green waste
6. Optional extra: collect wildflower seed locally and sow in trays and grow-on as small plants (plugs) which can be added to the meadow in spring and autumn

Info Box:

Grassy meadows (Action 2) can be made more flower rich at little cost by adding locally collected wildflower seed like Knapweed or Scabious. This seed can be grown in little pots and added as plugs to the grassy meadow in spring or autumn. Collecting and growing pollinator friendly wildflower seed might be something local schools or wildlife groups could get involved in

See website:
How-to-guide on collecting and using pollinator friendly wildflower seed.

Action 3:

Create a short flowering '6-week meadow'

Identify areas of grass that could be cut on a 6-weekly rotation to allow Clovers and Bird's-foot-trefoil to flower. This will provide food for pollinators where shortly mown grass does not. Such areas could be beside areas of shortly mown grass, a path or a meadow.

Action 4:

Let the Dandelions bloom!

Identify areas that will be mown under existing regimes, but aim to carry out the first grass cut of the year in April after the first flush of Dandelions, but before they set seed. Dandelions are a vital food source for bees in spring.

Pollinator friendly planting

Traditionally, a lot of deliberate planting in public spaces has been with annuals such as Begonia, Primula or Busy Lizzie. Unfortunately these are not good sources of pollen or nectar (as they have been bred to be very "showy") and do not provide food for bees and other insects. There are many other plants that can look similarly attractive but will also support our pollinators.

Areas where these actions might apply in a local community are: community gardens, roundabouts, road verges, parks or squares, housing estates, areas surrounding sports pitches, schools, car parks, shopping centres etc.

Action 5:

Clover lawn

Identify small areas where grass could be entirely replaced with a permanent clover mix. Red and white clovers will provide colour, and are a very important food source for bees.

Action 6:

Flowering trees and shrubs

Incorporate a mix of pollinator friendly trees and shrubs into the local community that will flower throughout the season [list in appendix]. An orchard can be a wonderful addition for pollinators and the community.

Action 7:

Perennial flowers for pollinators

Incorporate pollinator friendly perennial plants into the local community to provide food for pollinators from spring through to autumn [list in appendix].

Action 8:

Annual flowers for pollinators

Work with local authorities to ensure a component of annual planting in parks is with pollinator friendly annual plants - single rather than double flowered varieties [list in appendix].

Action 9:

Pollinator friendly urban planters

Identify some urban planters or hanging baskets where the standard annual bedding mix could be replaced by perennial pollinator friendly plants [list in appendix].

Action 10:

Pollinator friendly roundabouts

Work with local authorities to identify some roundabouts that could be planted in a pollinator friendly way e.g., bulbs (*Crocus*, *Alliums*) or pollinator friendly perennial plants in centre.

Action 11:

Create new hedgerows

Consider connecting isolated patches of high-quality pollinator habitat, or replacing fencing, by planting hedgerows.

Creating new hedgerows provides new habitats and food sources and allows pollinators to travel protected from wind and rain to access new foraging territory. When planting new hedgerows, only a mix of native pollinator-friendly species should be used.

Native shrubs are the most suitable. By providing a diverse range of species e.g. Willows, Blackthorn (spring flowering), Whitethorn, Wild Rose, Bramble, (summer flowering), Ivy (autumn flowering), there will be food available throughout the year. Whitethorn (also called Hawthorn) is a particularly good hedgerow species and usually makes up about 75% of saplings planted in a new native hedgerow, and ideally there should be at least four other native species alongside it. Small trees such as Holly, Rowan and Crab apple will also provide flowers in the summer.

Info Box:

At the Newry/Portadown branch of the Inland Waterways Association of Ireland, volunteers regenerated an area beside Moneypenny's Lock (Co. Armagh) for bees at very little cost by growing their own pollinator friendly plants from seeds, cuttings and root divisions.

D Provide wild pollinator nesting habitat: hedgerows, earth banks and hotels

Shelter

Nesting habitat for wild bees (bumblebees and solitary bees) is unobtrusive and easy to create. Wild bees live in small colonies and are entirely focussed on finding enough pollen and nectar to feed themselves and their offspring. They are not aggressive, have no interest in interacting with humans, and do not present any risk to the public.

Most solitary bees in Ireland are mining bees who nest in south or east facing slopes of bare earth (soil, sand, clay, peat)

Bumblebees nest in long grass, often at the base of a hedgerow. We have 62 species (types) of solitary bees who are mining bees. They nest by burrowing into bare ground or south/east facing banks of bare earth (soil, sand, clay, peat). The remaining 15 solitary bee species are cavity nesting bees who nest in south/east facing stone walls, masonry, wooden structures or commercially available bee nest boxes.

Areas where these actions might apply in a local community are: existing hedgerows, roadsides, verges, community buildings, housing estates, riverbanks, any free
common land where bee hotels could be kept (avoid popular areas that may be prone to vandalism).

Action 12

Hedgerows for pollinators

Flowering hedgerows that contain Hazel, Willow, Blackthorn and Hawthorn provide food in spring when wild bees come out of hibernation. Bramble is a good source of food in summer, and Ivy in the autumn. Bumblebees often nest in long grass at the base of hedgerows.

Where hedgerows exist:

1. Cut hedgerows every three years (outside the bird breeding season) to encourage flowering for pollinators and fruiting for birds. Avoid having all the hedges cut the same year, so that there is always some that will bloom and fruit in the area every year or cut one third of the hedge annually.
2. Make sure the base of hedgerows are not sprayed. This will allow flowering plants like Clovers, Vetches and Knapweed to provide additional food throughout the season and ensures nesting bees are safe.

3 Keep vegetation sparse on any sandy earth, or earth and stone banks e.g. by strimming, weeding, cutting, to provide nest sites for mining solitary bees.
4 If vegetation beside and under hedgerows needs to be cut, do so between September and March to allow bumblebees to nest during the summer.
5 For additional information see website: How-to-guide for creating and managing hedgerows

Action 13:

Earthbanks and drystone walls for pollinators

Where earth banks and drystone walls exist, visit them on sunny evenings in May–September to see if they are being used by nesting solitary bees. You will see small bees returning laden with yellow pollen. If you are lucky enough to find such nesting areas, protect these. Make sure no chemical sprays are used. Mark the area on maps and consider identifying the site as special and under protection from sprays for bees with a small sign or plaque.

Using just a spade, you can create and maintain earth banks for mining solitary bees where natural ridges/banks occur. This the best and most cost effective way to create nesting habitat for solitary bees. Once established, they should be maintained by manual scraping back to bare soil on an annual basis. See website: How-to-guide for creating wild pollinator nesting habitat.

Action 14:

Holes in wood for pollinators

Where wooden fencing exists in public areas, consider drilling small south or east facing holes for cavity nesting solitary bees. These holes should be 10cm in depth and 4-8mm diameter. A range of different diameters is best. They are added once, ideally at a height of 1.5-2m (or as high as possible). See website: How-to-guide for creating wild pollinator nesting habitat.

Action 15:

Bee hotels for pollinators

Incorporate small numbers of solitary bee nest boxes into the local community for cavity nesting solitary bees. Bee hotels can be useful and are a good awareness raising tool, but actions 13 and 14 are preferable ways to create nest sites. A number of small hotels is better than one large one in terms of minimising the risks of disease and predators killing the bees. See website: How-to-guide for creating wild pollinator nesting habitat.

E

Safety

Reduce the use of pesticides

In some cases, the use of pesticides (insecticides, fungicides, herbicides) is necessary e.g., the use of herbicides along railway tracks to ensure the health and safety of train passengers. In other cases, we have fallen into a pattern of using them as a way of tidying or sanitising our local areas. To minimise negative impacts on pollinators it is important that pesticides are used sustainably. This means they should ***only be used when necessary****, and efforts should be made to minimise their impact on non-target species like bees. Pesticides should always be applied* ***exactly*** *according to manufacturer guidelines*

Action 16

Eliminate the use of pesticides

Identify some areas where the use of pesticides could be eliminated. This could be streets/areas where your group is willing to take responsibility for manual weed control. Most herbicide use is along edging or tree bases that mowers can't access. Identify areas of south facing edging that could not be sprayed to provide solitary bee nesting habitat.

Action 17

Ensure best practise where the use of pesticides cannot be avoided

Identify areas that could be spot treated rather than with the use of blanket sprays. Spray in dry conditions with low wind speed to prevent drifting. Spray after sunset to avoid direct contact of pollinators with chemicals.

F Raise public awareness of pollinators within the local area

For the All-Ireland Pollinator Plan 2015-2020 to be successful we need to raise public awareness so that people know the importance of pollinators and understand why we all need to take action. Local communities can play a vital role in this regard.

Action 18:

Promote the Junior Pollinator Plan

Promote the junior version of the All-Ireland Pollinator Plan 2015-2020 to local schools and youth groups. This can be downloaded from the website **www.pollinators.ie**

Action 19:

Raise awareness within local businesses

Promote the All-Ireland Pollinator Plan to local businesses and encourage them to make their outdoor spaces pollinator friendly or to sponsor local pollinator friendly actions.

Action 20:

Put up signage

Put up signage explaining the importance of pollinators and what is being done locally to support the All-Ireland Pollinator Plan. Templates that can be used to create signage can be downloaded from the website.

Action 21:

Facilitate or deliver training

Facilitate or deliver training programmes locally on pollinators and how to take action to protect them. Resources will be available to allow interested parties to deliver training on: creating nest sites for wild pollinators; identification of common pollinator species; how to participate in the All-Ireland Bumblebee Monitoring Scheme; collection, storage and use of local wildflower seed to improve areas that are being managed as small grassy meadows in parks, schools, along greenways etc.

G Tracking progress and recognition for efforts

Progress in the implementation of the All-Ireland Pollinator Plan 2015-2020 will be carefully tracked. Success is not measured in having the Plan, but by knowing that it is working. A publicly available online mapping system will track pollinator friendly actions taken across the island and provide recognition to those who are helping.

The All-Ireland Bumblebee Monitoring Scheme is a citizen science initiative managed by the National Biodiversity Data Centre. It will be used to track changes in wild pollinators as the Plan is implemented.

Action 22

Log your 'Actions for Pollinators' on the mapping system

A publicly available online mapping system (Actions for Pollinators) will allow all those who take pollinator friendly actions to log their location and the action(s) taken. This will track the build-up of food, shelter and safety for pollinators in the landscape. It is hoped local communities will use the system to log what they are doing and show the creation of pollinator resources in their area. Once established, the system will help coordinate efforts locally between community groups, Local Authorities, Schools etc.

www.pollinators.ie

Action 23

Take part in the Bumblebee Monitoring Scheme

Identify interested people and set up at least one bumblebee monitoring scheme walk within your local community. In this scheme volunteers walk a fixed 1-2km route once a month between March and October and record the diversity and abundance of bumblebees that they see. The scheme is run by the National Biodiversity Data Centre who provide full support and training. The scheme is vital in tracking what is happening with wild pollinators in the landscape, and can be used to assess the effectiveness of any pollinator friendly actions that are being taken locally. If interested in taking part contact: info@biodiversityireland.ie

Action 24

Enter the Tidy Towns Pollinator award

If you are in the Republic of Ireland, make specific mention in your annual submission to the Tidy Towns competition (and your 3/5 year Tidy Towns Plan) that you are supporting the All-Ireland Pollinator Plan. Enter the Local Authority Pollinator Award in the national Tidy Towns competition.

Appendix

What plants are good for our pollinators?

Experts agree that inadequate nutrition is a major cause of pollinator declines. We want bees to be there when we need them, but our landscape doesn't provide the abundance and diversity of flowering plants that they need to survive throughout their life cycle. To have a healthy balanced diet, bees need to be able to feed on pollen and nectar from a range of different flowers from early spring to autumn. In local areas this can be a mixture of native and deliberately planted species.

Native plants

It is very important that we increase the amount of native plants in our local areas to provide food for bees and other insects. Often we can do this by managing the land in a slightly different way than we have become used to:

* Brackets denote the flowering period of the plant

✓ Plant more pollinator friendly native trees and shrubs: Hazel (Feb-Apr), Willow (Mar-May), Blackthorn (Mar-May), Hawthorn (Apr-Jun), Whitebeam (May-Jun), Rowan (May-Jun), Crab apple (Jun), Ivy (Sept-Nov). **You should source stock of local provenance where possible.**

✓ Maintain hedgerows and grassy banks or verges to encourage pollinator friendly native plants: Hawthorn (Apr-Jun), Bramble (May-Sept), Wild Carrot (Jun-Sept), Hogweed (Jun-Sept), Goldenrod (Jul-Sept), Rosebay Willowherb (Jun-Sept), Woundworts (Jul-Sept), Ivy (Sept-Nov).

✓ Have grassy meadows or areas of long grass to encourage pollinator friendly native plants: Dandelion (Mar-Oct), Vetch (Apr-Oct), Vetchling (May-Aug), Clovers (May-Oct), Bird's foot trefoil (Jun-Sept), Knapweed (Jun-Oct), Scabious (Jun-Oct), Self-heal (Jun-Aug), Yarrow (Jun-Oct), Thistle (Jun-Oct), Wild marjoram (Jul-Sept).

✓ Leave pavements, tracks or grassy edges unsprayed to encourage pollinator friendly native plants: Dead-nettle (Mar-Nov), Veronica (Mar-Sept), Forget-me-not (Apr-Sept), Geranium (Apr-Oct), Hawksbeard (Jun-Oct).

✓ Allow small areas to grow wild. Depending on where you are, you will encourage these pollinator friendly native plants: Butterbur (Mar-May), Coltsfoot (Mar-Apr), Bluebell (Apr-May), Brassicas (Apr-Aug), Red Bartsia (Jun-Sept), Foxglove (Jun-Sept), Fleabane (Jul-Sept).

These lists are **not** exhaustive, they simply provide examples of common pollinator friendly native plants that can be encouraged. The more native plants there are in our landscape the better, as they provide bees with a balanced diet.

Willow ©Tom Cuffe

Info Box:

Willow is a vital food source for bees in spring. In March-April observe Willows in your local area and note which are favoured by bumblebees and honeybees. Use these plants for hardwood cuttings next winter, creating a new willow plantation at little cost.

Deliberately planting horticultural or ornamental plants

Important: *In towns and villages non-native horticultural or ornamental plants can be an important food source for pollinators. However, you should* **not** *plant these in natural or semi-natural habitats. They should also not be planted in farmland (outside of farm gardens).*

Examples of pollinator friendly plants are provided below. Please note that these are **not** exhaustive lists. There are lots of other species that are also pollinator friendly. By observing bees in parks, gardens or even garden centres you can often see yourself which species they prefer.

Pollinator friendly annuals_Peter Cuthbert

Some garden centres and plant suppliers now use the Royal Horticultural Society (RHS) "Perfect for Pollinators" logo, so keep your eye out for this!

RHS PERFECT FOR POLLINATORS

Info Box:

Traditional bedding plants like Geraniums, Begonias, Busy Lizzy, Petunias, Polyanthus or *Salvia splendens* have virtually no pollen and nectar are of little value to pollinators.

Examples of pollinator friendly plants are provided below.

Please note that these are not exhaustive lists. There are lots of other species that are also pollinator friendly. By observing bees in parks, gardens or even garden centres you can often see yourself which species they prefer.

Trees/shrubs:

Berberis (April-May)
Broom (March-April)
Ceanothus (April-Sept)
Cotoneaster (May-Aug)
Deutzia (June-July)
Firethorn (May-June)
Forsythia (March-April)
Hebe (June-Oct)
Horse chestnut (May-June)
Lime (June-July)
Mahonia (Dec-May)
Sycamore (April-June)
Tetrodium (Aug-Oct)
Viburnum (April-May)
Non-native Willows (Feb-March)
e.g, *Salix aegyptica, Salix hastata 'Wehrhahnii'*

Herbs:

Basil (July-Sept)
Borage (April-Oct)
Lavender (June-Aug)
Oregano (June-Aug)
Rosemary (April-June)
Sage (June-Aug)
Thyme (May-Aug)

Fruit trees/bushes:

Apple (April-May)
Cherry (April-May)
Currants (April-May)
Plum (April-May)
Raspberry (June-Aug)


Berberis (April-May)


Borage (April-Oct)

Lavender_Dara Stanley

Perennial plants:

Perennial plants are generally better sources of pollen and nectar than annuals. They are also cost effective as they grow and flourish over the following years.

Perennial plants:

Helleborus (Feb-March)
e.g., Helleborus orientalis
Comfrey (March-June)
Pulmonaria (March-May)
Calamint (May-Sept)
e.g., *Calamintha nepeta spp nepeta*
Catmint (May-Sept)
e.g., *Nepeta* 'Six Hills Giant', 'Walkers Low'
Lamium (May-July)
e.g., *Lamium* 'Pink Chablis', *Lamium mac.* 'Album', *Lamium galeobdolon*
Poppy (May-Oct)
Rock rose (May-July)
Allium (June-Aug) e.g., *Allium aflatunense*, *Allium christophii*, *Allium giganteum*
Bellflower (June-Sept)
Delphinium (June-July)
Gaillardia (June-Sept)
Helenium(June-Aug) e.g., *Helenium* 'Moerheim Beauty'
Salvia (June-Sept)
e.g., *Salvia nemorosa* 'Caradonna', 'May Night', 'East Friesland'
Scabious (June-Sept)
e.g., *Scabious atropurpurea* varieties
Stachys (June-Sept)
e.g., *Stachys officinalis* 'Hummelo'
Viper's bugloss (June-July)
Aster (July-Oct) e.g., *Aster ageratoides* 'Asran', *Aster × frikartii* 'Mönch'
Coneflower (July-Oct)
Globe thistle (July-Aug)
Liatris (July-October) e.g., *Liastris spicata*
Perovskia (July-Oct) e.g., *Perovskia* 'Blue Spire'
Stonecrop (July-Sept) e.g., *Sedum* 'Autumn Joy'
Verbena (July-Oct) e.g., *Verbena bonariensis*
Eupatorium (Aug-Sept) e.g., *Eupatorium atropurpureum*
Heathers (Aug-Sept)
Perovskia (Aug-Sept)

In some cases particularly appropriate varieties are listed, otherwise any species/ variety of these plants will be good for pollinators.

Calamint_Peter Cuthbert

Info Box:

Bumblebees are particularly attracted to pollen and/or nectar rich plants in the blue-purple colour range

Annual plants:

Annuals can be useful sources of pollen and nectar for pollinating insects. If you are using annuals you should try to plant single rather than double flowered varieties. Good hardy annuals are:

Pollinator friendly annuals_Peter Cuthbert

Annual plants:

Californian Poppy
Cerinthe major **'purpurascens'**
Cornflower
Cosmos
Lavatera
Limnanthes douglasii
Annual poppy
Scabious
Night scented stock
Single sunflowers

Bulbs:

Snowdrop (Jan-Feb) e.g., *Galanthus nivalis*, *Galanthus elwesii*
Crocus (Feb-March)
Muscari armeniacum (March-May)
Allium (June-July)
Single flowered Dahlia, especially Bishop series (July-November)
Colchium (September-October)

Allium_Peter Cuthbert

Crocus (Feb-March)

Info Box:

Daffodils or Tulips are not a good source of food for pollinators. Bees will only use Daffodils if there are no other food sources available.

Hanging Baskets

Some hanging baskets could be planted to be more pollinator friendly. To minimise any public concerns, it is suggested that these are not those at head height along pedestrian areas. To make a hanging basket more pollinator friendly it is suggested that conventional trailing plants are mixed with some of these:

- Ageratum
- Alyssum 'Sweet White'
- Heliotrope 'Dwarf Marine'
- Verbena 'Blue Lagoon',' Desert Jewels Mixed'

Green manure

One of the most under-used methods of soil improvement is the use of green manures (or 'cover crops'). These are plants grown specifically to be dug back into the soil to improve it. If you have an area of poor soil, particularly in urban areas this can be a good approach. Buckwheat and Phacelia are an excellent green manure. Phacelia in particular is fast growing (average 7 weeks from sowing) and provides a great food source for pollinators. After flowering, they can be dug back in to improve the soil in anticipation of perennial planting.

Green manure with Phacelia_Peter Cuthbert

Winter Bedding

Winter bedding can provide an important food source in late autumn and early spring. Wallflowers are an excellent insect friendly plant at this time of year.

Wild flower seed

Please consider these important points before buying wildflower seed:

1. Wildflower meadows can be created naturally by reducing mowing regimes (Action 2). Overtime this will gradually lead to a flower rich meadow and avoids the need to purchase wild flower seed. This is the recommended option.
2. If you do decide to deliberately plant a wildflower meadow with commercially bought seed, it is important to use native species collected and grown on the island of Ireland. Please be aware that not all wildflower seed mixes will be pollinator friendly. Often wildflower seed bought commercially in supermarkets will not be native and may not contain pollinator friendly plants. Creating and managing a wildflower meadow from seed can be costly and requires careful planning and management to have any chance of success. See website for a how-to guide.
3. If you are considering "seed bombing" as a quick way of introducing wildflower seed please be aware that it is unlikely to be successful and is not recommended by the All-Ireland Pollinator Plan other than for awareness raising. If you do use seed bombs please try to ensure they are made up of native pollinator friendly species collected in Ireland.

Other useful sources of information:

www.heritagecouncil.ie/fileadmin/user_upload/Publications/Wildlife/wildlife.pdf
http://beekind.bumblebeeconservation.org/

Perennial plant_Lavendar © Andrea McDonagh

National Biodiversity Data Centre
Documenting Ireland's Wildlife

About the National Biodiversity Data Centre

The National Biodiversity Data Centre is a national organisation that collects and manages data to document Ireland's wildlife resource, and to track how it is changing.

Find out what biodiversity has already been recorded in your local area:
maps.biodiversityireland.ie

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

Northern Ireland Environment Agency
www.doeni.gov.uk/nieа

Wexford County Council

An Chomhairle Oidhreachta
The Heritage Council

Bord Bía
Irish Food Board

Department of Agriculture, Food and the Marine
An Roinn Talmhaíochta, Bia agus Mara

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Appendix 8

Garden actions to help pollinators

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National Biodiversity Data Series No. 9.

Gardens:

actions to help pollinators

All-Ireland Pollinator Plan 2015-2020

Implementation coordinated by the National Biodiversity Data Centre

National Biodiversity Data Centre
Documenting Ireland's Wildlife

pollinators.ie

Guidelines 2

Pollinator friendly garden_Anne Harrington Rees

Gardens: actions to help pollinators

We need pollinators to grow many of the fruits and vegetables that make up a balanced diet. The wildflowers that provide us with colour and beauty in our landscape also need pollinators, as do many of your garden plants.

Most pollination in Ireland is carried out by bees. This is because bees feed their young exclusively on pollen so are entirely focussed on collecting it from flowers to bring back to their nests. In Ireland, we have 98 different types of bee: the honeybee, 20 different bumblebees and 77 different solitary bees. In providing us with the service of pollination, these bees are helped by other insects like hoverflies, butterflies and moths.

Unfortunately, pollinators are in trouble. We know that one third of Irish bee species are threatened with extinction. The All-Ireland Pollinator Plan 2015-2020 is an island-wide attempt to help pollinators by creating a landscape where they can survive and thrive. All of us have a role to play in the Pollinator Plan, and gardens of any size can make a big difference.

These guidelines are aimed at anyone that wants to make their outdoor space more pollinator friendly. No matter the size, if your garden has pollinator friendly flowers it will provide a pit stop for hungry bees. Whether you have just a few window boxes, a medium or large garden, or are involved in a community garden, you'll find pollinator friendly actions here that relate to your space. We have suggested no or low-cost actions, ranging from very simple to slightly more involved, so you can pick the ones that suit you best.

Garden for pollinators so that you can grow your own fruit and vegetables, have a healthy balanced diet and see flowers and wildlife in your local landscape

What does a pollinator friendly garden look like?

Safety

Shelter

Food

For gardens to be good for pollinators, they need to provide food in the form of flowers, shelter for nesting and safety from chemicals.

Shelter: Solitary bee nest boxes

Shelter: Areas of long grass for bumblebee nesting

Safety: Manual weeding instead of pesticide use

Food: Flowering hedgerows, shrubs or trees

Food: Flowering hedgerows surrounding property

Food: Dandelions and clover blooming in strips or patches of long grass

Food: Pollinator friendly window boxes/hanging baskets/potted herbs

Shelter: Earth banks/ bare soil/ dry stone walls for solitary bee nesting

Food and shelter

A

Identify and protect existing areas that are good for pollinators

Your garden may already have areas that are providing food and shelter for pollinators. The easiest and most important thing you can do is identify and protect these spots.

Action 1:

Protect existing sources of food and shelter for pollinators

If the following already occur in your garden, they should be protected: patches of wildflowers or "weedy" plants (food); flowering hedgerows (food); bare soil on flat or sloped ground, e.g. lawn edging (shelter); long grass (shelter); dry stone walls (shelter).

Food

B

Reduce the frequency of mowing of grassy areas

The most cost-effective way to provide food for pollinators is to reduce the frequency of mowing in some areas of your garden and allow wildflowers to grow naturally in the longer grass. However this does not mean that you have to let your garden grow completely wild. The actions below suggest different ways that you can reduce mowing in your garden to make your lawn useful for pollinators.

Action 2:

Let the Dandelions bloom!

Continue to mow as usual, with one simple change; don't cut your grass until mid-April, after the Dandelions have flowered but before they set seed. Dandelions provide a vital source of spring food for pollinators.

Info Box:

Some plants we usually think of as weeds, like Bramble, Clovers, Thistles, Ivy, Nettles and Dandelions, provide an important source of food for all types of pollinators. Consider keeping a small section of your garden where these types of plants are allowed to grow.

Info Box:

In early spring, one bumblebee queen needs to feed on 6000 flowers a day to have enough energy to raise her young! Having plants in your garden that flower in March and April is critical for these hungry queen bees.

Action 3:

Mow your grass every 6 weeks

Consider cutting some areas of your lawn on a 6-week rotation. This will allow flowers like Clover to bloom, providing more food for pollinators.

Action 4:

Reduce mowing to create a wildflower patch, strip or meadow

Some gardens may be large enough to allow portions of the grass to grow long. This will provide native flowers for food. You can transform your whole lawn into a wildflower meadow, or alternatively can create small patches or strips in part of your garden. By changing your mowing regime as described below, over a number of years this portion of your garden will become more and more flower-rich, and you won't even have to buy pollinator friendly plants or seed!

Option 1: Patches of long grass

Option 2: Strips of long grass

Option 3: Grassy meadow

1. Wait until April to do the first grass cut to allow some Dandelions to flower
2. During the summer, allow the grass to grow long
3. Cut again in early September. If grass growth is very strong and the vegetation is falling over under its own weight, cut sooner e.g. July and again in September. After a few years as soil fertility is lowered, this earlier cut will no longer be necessary and one cut at the end of the summer will be enough
4. The grass cuttings should be removed after each cut to reduce soil fertility over time. If the area is large and accessible to a tractor, it can be baled for hay or haylage. Otherwise rake it off the area and compost it, use as mulch or dispose as green waste
5. **Optional extra:** collect wildflower seed locally and sow in trays and grow-on as small plants (plugs) which can be added to the meadow in spring and autumn. For more information see website: How-to-guide for using pollinator friendly wildflower seed

If you want your meadow to be more flower-rich, you can sow commercially bought seed. Just keep in mind that many sites are not suitable for seed mixes. **Note:** Only purchase seed mixes that have been grown in Ireland from native wildflowers, and contain pollinator friendly plants. Wildflower seed packets for sale in supermarkets often fail to meet these requirements. For more information see website: How-to-guide for creating and managing a wildflower meadow.

Info Box:
Fertilisers promote grass growth; avoid using them in any areas where you want wildflowers to grow

Food

C

Pollinator Friendly Planting

In order to survive, pollinators need flowers that produce lots of nectar (for energy) and pollen (for protein). If you want to make your garden pollinator friendly, the key is to avoid 'hunger gaps,' or times when there are no nectar or pollen-rich flowers in bloom. As an added benefit, if you always have something flowering in your garden to attract and feed pollinators, these insects will be there to visit your pollinator-dependent fruits and vegetables. There are a huge variety of garden plants to choose from that are colourful, attractive, and can provide pollinators with the food they need.

Note: The suggested planting lists in this section are NOT exhaustive; many other plants are also good for pollinators. Never plant ornamental plants in natural or semi-natural habitats.

How do you know if a plant is pollinator friendly?

- Single instead of double flowered varieties: double flowered varieties provide almost no nectar and pollen for pollinators
- Perennials over annuals: perennial plants are generally better sources of pollen and nectar
- Do you see pollinators visiting it? When choosing plants to buy at a garden centre, you will quickly realise what flowers pollinators visit most. Also keep an eye out for the Royal Horticultural Society's "Perfect for Pollinators" logo, which is now used by many suppliers of garden plants

Action 5:

Have pollinator friendly plants flowering in your garden from March-October

Many gardens have plenty of flowers in the summer, but providing food for pollinators in spring and autumn is hugely important. You can provide pollinators with flowers by allowing native wildflowers to grow naturally in your lawn, or through deliberate planting. See the table on page 8 for examples of the sorts of plants you can add to ensure there are flowers blooming in every season.

Action 6:

Pollinator friendly window boxes/hanging baskets/patio pots

Incorporating some pollinator friendly plants in window boxes, hanging baskets or other containers can be done in any garden, but is particularly useful for homes with little outdoor space. Many pollinator friendly herbs also grow well in pots. Below are examples of pollinator-friendly annuals and perennials that do well in containers.

Annuals for window boxes

Alyssum 'Sweet White'
Floss Flower
Cosmos
Heliotrope 'Dwarf Marine'
Night scented stock
Poached egg plant

Perennials for window boxes

Aubrieta
Wallflower
Bellflower
Trailing Verbena

Herbs for pots

Borage
Chives
Lavender
Rosemary
Sage
Thyme

Action 7:

Plant pollinator friendly bulbs to flower next spring

Daffodils and Tulips are not the best for pollinators. You don't have to replace these beloved plants, but this autumn why not try also planting some pollinator friendly bulbs? Examples include: Snowdrop (*Galanthus nivalis*, *Galanthus elwesii*); Crocus; Allium; Grape Hyacinth *(Muscari armeniacum);* and Single flowered Dahlia, especially Bishop series.

Action 8:

Use green manures that are pollinator friendly

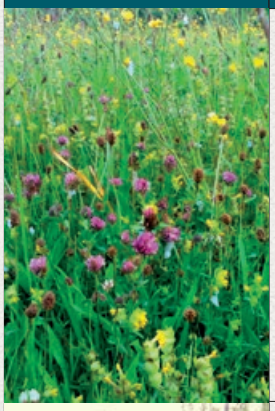
Green manure or 'cover crops' are plants grown specifically to be dug back into the soil to improve it for perennial planting. While in flower green manure plants can be great for pollinators, e.g. Buckwheat and Phacelia provide lots of pollen and nectar.

Info Box:

Traditional bedding plants like Geraniums, Begonias, Busy Lizzy, and Petunias have virtually no pollen and nectar and are of little value to pollinators

Pollinator friendly garden plants

Aim to have 3-5 different types of these plants flowering in your garden each season. These suggestions are **not** exhaustive; many other flowers are also good for pollinators. For more planting suggestions visit **www.rhs.org.uk/perfectforpollinators.**

		SPRING	SUMMER	AUTUMN
		March-May	June-Aug	Sept-Oct
	**Wildflowers in long grass** These are examples of plants that will grow naturally in long grass; you do not need to buy seed or plants!	Dandelion Dead-nettle Vetch	Bird's foot trefoil Brassicas Clovers Geranium Knapweed Oxeye daisy Self-heal Speedwell Thistle Vetch Yarrow	Autumn Hawkbit Clovers Hawksbeard Vetch
	**Ornamental plants and herbs**	Comfrey Hellebores Lungwort Spring/winter Heather	Borage Calamint Catmint Columbine Delphinium Globe thistle Lavender Oregano Penstemon Poppy Scabious Stachys Sneezeweed Thyme Viper's bugloss	Aster Button Snakewort Coneflower Eupatorium Heathers Single Sunflowers(Annual) Stonecrop
	**Flowering trees/ shrubs**	Barberry (Berberis) Broom Crab apple Forsythia Hawthorn Mahonia Rowan Viburnum Wild cherry Willow	Bramble Cotoneaster Deutzia Firethorn Laburnum Rock Rose Viburnum	Hebe Ivy Russian Sage (sub-shrub)
	**Fruit and Veg** Many of the fruits and vegetables you grow in your garden need pollinators to produce seeds and fruit!	Apples Blueberries Cherry plum Currants	Blackberries Courgettes Field/runner beans Pumpkins Raspberries Strawberries Tomatoes	

Info Box:
Letting a small portion of Brassica plants (e.g. Cabbage, Kale, Brussel sprouts) flower can help provide food for pollinators in your garden

Shelter

D Provide wild pollinator nesting habitat

In addition to food, pollinators also need safe places to nest. Nesting habitat for wild bees (bumblebees and solitary bees) is safe, unobtrusive and easy to create in your garden. Take some of the following actions to provide shelter for wild pollinators.

Bumblebee colonies nest in long grass or in abandoned rodent holes. Solitary bees nest in two ways: only a small number of Ireland's solitary bees (15 out of 77) nest in existing cavities like holes in stone walls, wood, or commercially available bee boxes. The rest are mining bees that burrow into bare ground or south/east facing earth banks. Wild bees are not aggressive, so it is perfectly safe to have them nesting in your garden.

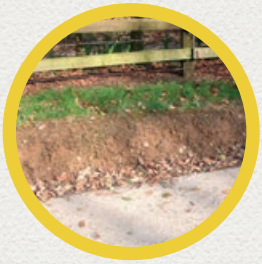
Action 9:

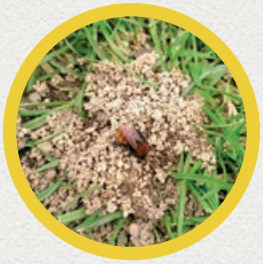
Create nesting habitat for solitary mining bees

Solitary mining bees need areas of bare ground to be able to burrow into the soil and create their nests. Scrape away some grass in flat, sunny spots in your garden to create areas for these bees to nest.

Some mining bees prefer to nest on south or east facing slopes with bare ground; you can easily create these habitats in your garden using a spade. Scrape back any vegetation that grows on these earth banks manually each year, to ensure the spots remain bare.

For more information see website: How-to-guide for creating wild pollinator nesting habitat





Action 10:

Create nesting habitat for cavity nesting solitary bees

There are many ways to create nesting habitats for the small number of Irish solitary bees that prefer to nest in exiting cavities.

1. Some solitary bees nest in hollow stems of plants. If you grow raspberries, leave some of the old canes unpruned each year to provide habitats for these bees
2. Drill south or east facing holes in wooden fencing for solitary bees to nest in. These holes should be 10cm deep and range from 4-8mm in diameter. Add them at a height of at least 1.5-2m
3. Buy or make a solitary bee hotel for your garden

For more information see website: How-to-guide for creating wild pollinator nesting habitat

Action 11:

Hedgerows for pollinators

Bumblebees often nest in the long grass at the base of flowering hedgerows. If you do not already have them in your garden, consider planting hedgerows made of flowering trees and shrubs such as Hazel, Willow, Blackthorn and Hawthorn. You can manage existing hedgerows for pollinators by:

1. Cutting on a three year rotation (outside the bird breeding season)
2. Avoid cutting all hedges in the same year so some are always flowering
3. Let the grass grow long at the base of the hedges, and be sure not to spray it. If these areas do need to be cut, do so between September and March to avoid disturbing nesting bees

For more information see website: How-to-guide hedgerows for pollinators

Safety

E Eliminate pesticide use

Pesticides include insecticides, fungicides and herbicides. All of these can be harmful to pollinators, either directly, or by damaging the plants and habitats they depend on.

Action 12:

Don't use insecticides on garden flowers and plants

Use alternative methods of pest control, such as manual barriers or physical removal. Try this approach for just one season, or on part of your garden, and see how much pest damage results; often levels will be very low.

Note: some seeds and plants are treated with systemic insecticides called neonicotinoids. Try reading the fine print to ensure the products you buy are not treated with these harmful chemicals.

Action 13:

Don't use herbicide on your lawn

Lawns where some wildflowers are allowed to grow provide valuable food for pollinators. If some areas must be kept green, weed manually instead of spraying.

Action 14:

Don't use herbicide on the verges outside your house

If left alone, road verges can provide important areas for pollinators to feed and nest.

Action 15:

Ensure best practice where the use of pesticides cannot be avoided

If there are plants or areas in your garden that must be treated with pesticides, always follow the manufacturer guidelines exactly when applying.

1. Spot treat rather than blanket spray an entire area
2. Spray in dry conditions with low wind speed to prevent drifting
3. Spray after sunset to avoid direct contact of pollinators with chemicals

Info Box:

In addition to pollinating flowers, hoverflies can play an important role in controlling garden pests. Some hoverfly larvae feed on aphids, reducing or eliminating the need to spray.

F Raise awareness of pollinators with family, friends and the local community

More people are starting to understand how important pollinators are and what we can do to help them, but we need to keep spreading the word, especially to the next generation.

Action 16:

Junior Version of the All-Ireland Pollinator Plan

Download the Junior Pollinator Plan from our website and read it with your family. Community gardens could also promote the Junior Plan to local schools and youth groups.

Action 17:

Share pollinator friendly plants

Plants and seed can be expensive, but for many pollinator friendly species, existing plants can be divided or new plants can be grown from cuttings. For fruit and vegetable plants, check to see if your local GIY group already has seed or cutting exchanges.

Five pollinator friendly plants that can be shared

1. **Lavender** Seed or cuttings
2. **Sage** Divide existing plants
3. **Thyme** Seed or cuttings
4. **Viper's Bugloss** Sow from seeds
5. **Willow** Hardwood cuttings

Action 18:

Give the pollinator friendly property management sheet to your estates management company or residents association

If you live in an apartment or estate, your garden is probably maintained by a property management company or resident's association. There is a printable, one-page summary at the back of these guidelines that can be provided to these groups. Ask them to consider manging the land they are responsible for in a pollinator friendly way.

G Tracking progress and recognition for efforts

Progress in the implementation of the All-Ireland Pollinator Plan 2015-2020 will be carefully tracked. A publically available mapping system will track pollinator friendly actions taken by everyone across the island and provide recognition to those that are helping.

Action 19:

Add your garden to our publicly available mapping system, 'Actions for Pollinators'

'Actions for Pollinators' is a publically available online mapping system that allows everyone who takes pollinator friendly actions to log their efforts. Add your garden to this system to help us track the build-up of food, shelter and safety for pollinators in the landscape (https://pollinators.biodiversityireland.ie/). This system can also be used to score each garden. See the box below to find out how your garden can achieve GOLD POLLINATOR STATUS.

How to make your garden GOLDEN for pollinators

In order to receive gold status, your garden must provide the best food, shelter and safety for pollinators by meeting the following three criteria:

1 **Food:** Have at least 5 different types of pollinator friendly plants flowering in each season- spring, summer and autumn (see table in section C for examples, although any pollinator friendly plants from the RHS perfect for pollinators list, www.rhs.org.uk/perfectforpollinators, will also count)

2 **Shelter:** Create nesting habitats for solitary bees. Some habitats in your garden must be suitable for both cavity nesting AND mining bees (see section D for more information)

3 **Safety:** Completely eliminate the use of all pesticides in your garden (see section E for more information)

Action 20:

Learn to identify pollinators and record what is in your garden

Many of our pollinators can be identified easily when they are feeding on flowers. Visit the Pollinator Plan website to find resources for identifying the types of pollinators in your garden. You can also become part of the All-Ireland Bumblebee Monitoring Scheme. This is a citizen science initiative managed by the National Biodiversity Data Centre. Once a month, you walk a fixed route and record all the bumblebees you see. This information can be used to track changes in wild pollinators as the Pollinator Plan is implemented. If interested in taking part contact info@biodiversityireland.ie.

Pollinator friendly guide for estates management

Pollinators are important for our health, wealth and environment. If you have been given this sheet, the people living in the properties you manage are concerned about their local pollinators. Show them you care by taking these five no-cost measures to help pollinators:

1. **Let the Dandelions bloom:** wait until late April to do the first grass cut. This allows some Dandelions to flower, providing bees with much needed food in the spring
2. **Do not spray edging or bases of trees:** avoid using pesticides to tidy up these areas; strim instead, or let the grass here grow to provide pollinators with food
3. **Protect hedgerows, dry stone walls and earth banks:** especially when south facing, these areas are important nesting sites for harmless solitary bees. Avoid using pesticides on these areas
4. **Create a '6-week meadow':** cut small areas or strips of grass on a 6-week rotation to provide more wildflowers for pollinators
5. If you take any pollinator friendly measures, log them on the publically available mapping system, **'Actions for Pollinators.'** Let everyone know that your company is doing its part for pollinators https://pollinators.biodiversityireland.ie

Signage templates to inform the community that areas are being protected for pollinators can be downloaded from our website: www.pollinators.ie

The All-Ireland Pollinator Plan 2015-2020 is a call to action to help our pollinators. This initiative is supported by over 68 governmental and nongovernmental organisations. During the implementation phase, businesses are actively being encouraged to sign up in support of the Plan. If you have taken some of the suggested pollinator friendly actions above and want your company to be listed as a supporter, get in touch: info@biodiversityireland.ie

www.pollinators.ie

National Biodiversity Data Centre
Documenting Ireland's Wildlife

About the National Biodiversity Data Centre

The National Biodiversity Data Centre is a national organisation that collects and manages data to document Ireland's wildlife resource, and to track how it is changing.

Find out what biodiversity has already been recorded in your local area:
maps.biodiversityireland.ie

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

Text: Erin Jo Tiedeken & Úna FitzPatrick (National Biodiveristy Data Centre), & Jane Stout (Trinity College Dublin)
Design: Vitamin Studio, Waterford
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An Chomhairle Oidhreachta
The Heritage Council

Bord Bia
Irish Food Board

Department of Agriculture, Food and the Marine
An Roinn Talmhaíochta, Bia agus Mara

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GIY Grow it Yourself Together We Grow

Community Gardens Ireland

Appendix 9

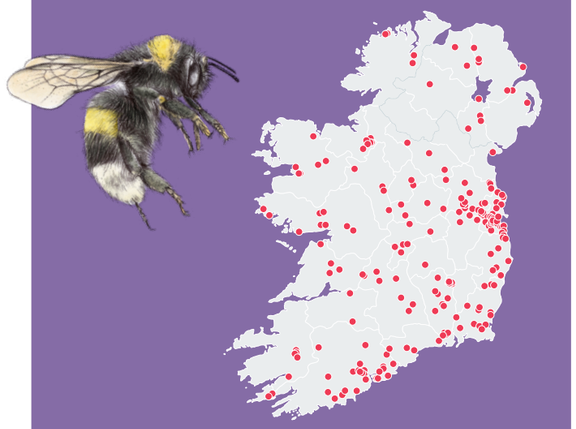
Pledge your garden for pollinators

Pledge your Garden for Pollinators

Our pollinating insects are in decline, with one-third of our 98 wild bee species at risk of extinction. The All-Ireland Pollinator Plan aims to reverse these declines and make the island a place where pollinators can survive and thrive. By taking simple steps in your garden, you will help provide much-needed food and shelter for our pollinating insects, while creating a beautiful, colourful garden.

See ***pollinators.ie/gardens*** for lots of advice, videos, pollinator-friendly plant lists and to download our booklet: ***Gardens: Actions to Help Pollinators***.

Put your garden on the Map!
The Pollinator Plan's online mapping system tracks actions for pollinators across the island. Please add your pollinator-friendly garden to our map at:
pollinators.biodiversityireland.ie



All-Ireland Pollinator Plan
www.pollinators.ie

I'm pledging my garden for pollinators

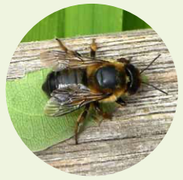
Pledge your garden for pollinators at
www.pollinators.ie

Here is just a small sample of common pollinators you may see in your garden if you reduce grass-cutting and provide pollinator-friendly plants.
And remember, if you help pollinators, you are also helping all our biodiversity.

The **Red-tailed bumblebee** is all black apart from its red tail. It is very common in gardens.

The **Early bumblebee** is Ireland's smallest bumblebee. It is excellent at pollinating fruit and vegetables, especially raspberries.

This **Marmalade hoverfly** is common in gardens. The adults feed on nectar, but the larvae feed on aphids, making this a very useful garden visitor!



Leaf-cutter Bees cut circles of leaves or petals to line their nest. We have five different types in Ireland. These are the bees most likely to use your garden bee box.

The **Grey mining bee** is black with two grey stripes. Like most of our 62 solitary bee species in Ireland, it nests by making tiny little burrows in bare soil.

The **Garden Tiger moth** is just one of approx.1,400 moth species in Ireland. Its larvae feed on Dandelion leaves.

Here are just some ideas for ways you can help pollinators each month:

January

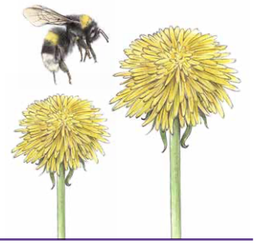
Make a pollinator plan for your garden
Wild pollinators are hibernating now and don't need our help just yet, but you can use this time to get prepared. Look through all our tips, videos and plant lists at *www.pollinators.ie*, and draw up a 'pollinator plan' for your garden.

February

Create solitary bee nesting sites
Expose a south/east-facing bank by removing vegetation for mining bees. Or erect a small bee hotel for cavity-nesting bees. See ***'Creating Wild Pollinator Nesting Habitat'*** guide at *pollinators.ie/gardens*

March

Let Dandelions Bee
The humble *Dandelion* is a super food for pollinators. If you can avoid cutting your lawn while *Dandelions* are flowering in March and April, you will be helping to provide much-needed food for early pollinators.



April

Pots for Pollinators
Even if you only have a very small garden or none at all, you can still help. Plant a 'pot for pollinators' to flower on your patio, balcony or window sill throughout the season. See instruction guide at *pollinators.ie/gardens*

May

No Mow May
Could you leave your lawn mower in the garage during May? This will allow *Red* and *White Clover* to bloom in your lawn to feed the hungry bees.
(True bee-lovers cut their grass just once a month – at the end of June, July and August – to let wildflowers bloom all summer!)

June

Ask your garden centre for pollinator-friendly plants
Unfortunately *Daffodils*, *Tulips*, and traditional bedding plants, such as *Begonias* or *Petunias*, are of little value to pollinators. But there are lots of pollinator-friendly options to choose from.
See *pollinators.ie/resources*

July

Hanging baskets can be pollinator-friendly too
Considering a hanging basket? Make sure it contains *Bidens* or *Bacopa*, pollen-rich flowers that do well in containers.

August

Collect wildflower seeds
It is important to only plant native wildflower seed of local provenance. August is a good time to collect seed locally from your favourite wildflowers. This can be grown on in pots and then added as plugs to your wildflower patch. See our guide ***'Collecting and using pollinator-friendly Wildflower Seed'*** at *pollinators.ie/resources*

September

Cut long-flowering meadows now
If you have a long-flowering annual meadow area, it is very important to cut and 'lift' or remove clippings now. This helps to reduce fertility of the soil (wildflowers grow best in less fertile soils).

October

Plant a shrub, tree or native hedgerow
Add a pollinator-friendly shrub or tree to your garden that will flower and provide food for pollinators for years to come. There are lots of different types and sizes to choose from!

November

Plant bee-friendly bulbs
Plant pollinator-friendly bulbs such as *Crocus* or *Snowdrops* now, to flower next February/March. This will give early bumblebees a good start to the new year.

December

Take willow cuttings locally to plant in your garden
Willow can be grown easily from cuttings. (It's best to plant well away from house to avoid damaging pipework.) Don't forget you can also create pollinator-friendly gardens in your school, business, or housing estate. Winter is a good time to make plans.

All-Ireland Pollinator Plan
www.pollinators.ie

National Biodiversity Data Centre
A Heritage Council Programme

Heritage Officer Programme

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An Chomhairle Oidhreachta
The Heritage Council

Design and artwork
NaturalWorldDesign.ie

All-Ireland Pollinator Plan
www.pollinators.ie

A pollinator-friendly garden provides **FOOD** in the form of pollen-rich flowers, **SHELTER** for nesting, and **SAFETY** by eliminating chemicals. Try to make sure your garden has pollinator-friendly flowers in bloom from mid-February through to the end of October.

FOOD
Add pollinator-friendly flowers such as *Bidens* or *Bacopa* to hanging baskets and window boxes.

FOOD
Plant pollinator-friendly shrubs.


BERBERIS

FIRETHORN


HEATHERS


MAHONIA

FOOD
Native flowering hedgerows, such as *Hawthorn* or *Blackthorn* provide important food in spring.


HAWTHORN


BLACKTHORN

FOOD
Plant pollinator-friendly trees such as *apple trees*, or native trees such as *Wild Cherry* or *Rowan*.


APPLE


ROWAN

FOOD
Plant big patches of each pollinator-friendly plant for better foraging efficiency.

FOOD
Plant pollinator-friendly containers. Choose pollinator-friendly bulbs, such as *Crocus*, which will flower in early spring.

FOOD
Allow *Ivy* and *Bramble* to grow in a corner of your garden as they provide important food sources in late summer and autumn for pollinators.


IVY


BRAMBLE

SHELTER
Areas of long grass for bumblebees to nest.

SHELTER
Erect a small bee hotel for cavity-nesting solitary bees. You could also simply drill holes in walls or fencing.

SHELTER
Earth Banks bare soil/dry stone walls for nesting solitary bees.
Did you know only 10 species of Irish bees are likely to use a garden nest box, but we have 62 species of mining bees?

FOOD
Your fruit and veg. patch will benefit from pollinators and vice versa.

SAFETY
Avoid using harmful chemicals.

FOOD
Reduce mowing to allow wildflowers to bloom around your lawn in patches or strips (you don't have to buy wildflower seed! just stop mowing). This is the most cost-effective way to help pollinators. The more of these flowers, the better:


DANDELION


DEAD NETTLE


SELFHEAL


BIRD'S-FOOT TREFOIL


CLOVER

FOOD
Create a herb bed to benefit your cooking as well as the bees!


CHIVES


THYME


OREGANO


ROSEMARY

While reducing mowing and planting native trees and shrubs is always best for biodiversity, there are also lots of pollinator-friendly ornamental plants. Here is just a small selection:

SPRING SUMMER AUTUMN WINTER


GRAPE HYACINTH

WALLFLOWER


BROOM

COMFREY


ALIUM

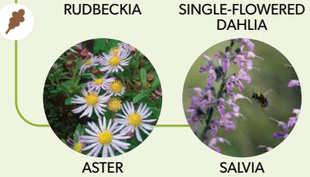
CATMINT


LAVENDER

STONECROP


RUDBECKIA

SINGLE-FLOWERED DAHLIA


ASTER

SALVIA


HELLEBORUS

WILLOW

CROCUS

SNOWDROP

You can find lists of pollinator-friendly flowers, shrubs and trees at ***www.pollinators.ie***

Appendix 10

Pollinator zone sign template

Pollinator Friendly Zone

All-Ireland Pollinator Plan

National Biodiversity Data Centre
Documenting Ireland's Wildlife

www.pollinators.ie

Appendix 11

Public wildflower project areas

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Area 1. Potential coastal wildflower area adjacent to Liebherr building</td><td>Area 1. Sea campion colonising gravels</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Area 2. Potential wildflower meadow adjacent to the end of the greenway/playground</td></tr>
</table>

Area 1

This area lies between the Liebherr building and the rock armoured shore at the port. It is underlain by some type of terram and overlain by small pebbles and stones. It has already begun to colonise with coastal wildflowers including sea campion, bird's-foot-trefoil and buck's horn plantain. This area can be left to colonise naturally with coastal wildflowers and grasses from nearby areas.

Area 2

This grassed area lies adjacent to the end of the greenway and just north of the playground. There is a gravel path that runs through from the playground to the old railway footbridge. Wildflowers growing here included ribwort plantain, daisy, dandelion, and clovers. The stone wall supports mosses, lichens, ferns such as maidenhair spleenwort, and wildflowers such as ivy, mouse-ear hawkweed,

black medic, common ragwort, and buck's-horn plantain. This area can be left unmown until later in the summer to allow the native grasses and wildflowers to prosper. A strip on either side of the path can be mown if necessary to facilitate walkers.