



Local Biodiversity Action Plan

for

Portlaoise, Co. Laois

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For

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An Chomhairle Oidhreachta
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1. Acknowledgements

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All photographs and habitat maps are by the author Fiona Mac Gowan unless otherwise stated.

2. Introduction

This Local Biodiversity Action Plan has been created as a joint venture between the Portlaoise community and Laois County Council with the support of the Heritage Council. Dr Fiona Mac Gowan met with the Portlaoise Tidy Towns representatives in May 2015 on behalf of the County Council to devise this plan. The meeting involved a walkabout of the Portlaoise area where the local community was able to study and discuss problem areas and biodiversity highlights of the locality with the ecologist.

This project is a further development of a 2013 Laois Partnership project which involved commissioning Kearney Consultants and Dr Fiona Mac Gowan to run training courses for local communities about biodiversity in their own localities.

The outcome of the original Laois Partnership project was the publication in 2014 of Local Biodiversity Action Plans for seven different Laois towns and villages: Abbeyleix, Ballacolla, Cullahill, Emo, Killenard, Mountmellick and Portarlinton.

This Local Biodiversity Action Plan (LBAP) takes account of environmental issues and challenges present in Portlaoise at this time and provides a framework to manage biodiversity in the area. While its priorities are currently relevant, it is inevitable that new challenges and issues will develop and the LBAP will have to be adapted to cater for these changes.

Regular review of the LBAP will take place at the same time that the Tidy Towns Committee is preparing its annual workplan.

3. Main Concepts

What is Biodiversity?

Biodiversity is the diversity of life, the diversity of all the organisms that occur on Earth – everything from birds to bugs to mammals to trees to reptiles to lichens to fish to mosses to amphibians to algae and everything in between! The term biodiversity includes genetic diversity i.e. the differences within species e.g. the differences from one person to the next.

Examples of Biodiversity found in Portlaoise



Elm



Mute swan family



Hawthorn

Why are Biodiversity & Ecology important?

Humans are an integral part of the Biodiversity of Earth and our actions can affect it in both a positive and negative way.

Ecology deals with the inter-relations between organisms and the places in which they live

This can refer to human beings' dealings and interactions with both the habitats and species around them. So Biodiversity and Ecology affect our lives every day without us even realising it!

A Habitat is the type of area where an organism or a number of organisms are at home



Bees pollinate crops and flowering plants



Hazelnuts—an ecosystem service of the Hazel tree

Ireland's National Biodiversity Action Plan

There is a national background to this LBAP through Ireland's National Biodiversity Action Plan *Actions for Biodiversity 2011-2016* by the Department of Arts, Heritage & the Gaeltacht. The National BAP explains how Ireland is one of 193 countries who are parties to the Convention on Biological Diversity along with the other EU Member States and the EU itself. In 2002, the Parties to the Convention, including Ireland, committed themselves to achieve by 2010 a significant reduction of the rate of biodiversity loss at the global, regional and national levels as a contribution to poverty alleviation and to the benefit of all life on Earth. In 2006 the European Commission set out a target of halting biodiversity loss by 2010 but this target has not been reached. The National BAP gives the following description of the current status of biodiversity:

“Europe is seeing the constant loss, degradation and fragmentation of natural habitats and entire ecosystems are also being pushed to the point of collapse. Globally, the picture is far worse: biodiversity and ecosystem services are being lost at an alarming rate. Maintaining the functionality of ecosystems has become increasingly urgent. Current trends are bringing us closer to a number of potential tipping points that could catastrophically reduce the capacity of ecosystems to provide these essential services. The ecological footprint of humanity exceeds the biological capacity of the Earth by a wider margin than it did at the beginning of this Millennium”

Department of Arts, Heritage & the Gaeltacht (2011).

The National BAP lists Ireland's main obligations under the UN Convention on Biological Diversity under the following themes:

- Conservation of ecosystems, habitats and species in their natural surroundings, both inside and outside protected areas (*in situ* conservation)
- Conservation of the components of biological diversity outside their natural habitats (*ex situ* conservation)
- Impact assessment
- Identification and monitoring
- Sustainable use of ecosystems, species and other biological resources
- Adoption of incentive measures
- Research and training
- Public awareness and education
- Policies and mechanisms for equitable sharing of benefits of genetic resources
- Facilitating access and transfer of technology
- Exchange of information
- Technical and scientific cooperation
- Access to and safe use of biotechnology

- Provision of financial resources to achieve the Convention's objectives, both nationally and to developing countries

The All-Ireland Pollinator Plan

A plan was published during 2015 which takes a new approach to conservation of biodiversity. The All Ireland Pollinator Plan (2015-2020) takes a look at the insects that pollinate our crops and other plants and outlines actions that can be taken by all sectors of society to protect our future by caring for our pollinators. In Ireland, most pollination is carried out by bees, but people are often surprised to hear that this includes 98 different species! Honeybees are the best known, but we have 20 different species of bumblebee and 77 solitary bee species. One third of our wild bee species are known to be threatened with extinction in Ireland. They are declining due to lack of food, places to nest, pests and diseases and the impact of pesticides and herbicides.

Many of the actions outlines in this LBAP will benefit Ireland's pollinators either directly or indirectly: leaving grass uncut to enhance wildflowers which will provide food for insects (Figure 1); reducing the use of pesticides and herbicides will benefit pollinators and all insects; solitary bees may well take up residence in some of the new bug hotels planned! Tidy Towns groups may also consider signing up to be partners in the Pollinator Plan, making a commitment to implement positive actions to protect pollinators.

Details of the All Ireland Pollinator Plan are at www.biodiversityireland.ie/pollinator-plan.



Figure 1: Roadside verge left uncut to benefit wildflowers and pollinators, with sign explaining the project (Photo credit: Ulster Wildlife Trust)

What is a Local Biodiversity Action Plan (LBAP)?

One action of the National Biodiversity Action Plan is the production of Local Biodiversity Action Plans. In many areas, these have been written at county level, but in Laois the novel approach of publishing plans at

the much more local level, led by the local communities, has been taken. This will, we hope, lead to more community investment in implementing the plans, and will therefore increase their chances of successfully conserving and enhancing biodiversity.

A Local Biodiversity Action Plan (LBAP for short) is a document which acts as a guide in the management of your local area in the conservation, enhancement and enjoyment of local biodiversity. Conservation and enhancement of biodiversity in your local area has a wide-ranging number of benefits for your local community:

- Increased quality of life – pleasant places to walk or sit down and take a break and/or listen to beautiful birdsong
- There is increasing evidence of the value for children of spending time in nature, and of the health benefits for all of us of spending more time enjoying the natural world
- Pollination of flowers and crops by insects such as bees
- Pest control e.g.: Bats eating biting midges; Ladybirds eating greenflies
- An increased number of plants especially trees in an area will lead to cleaner air in the local environment
- Insects, invertebrates, (e.g. worms, slugs and snails) & fungi help breakdown dead and decaying material e.g. make compost and improve soil condition and fertility
- A healthy local environment increases the health and well-being of the locality's citizens
- Impossible to quantify the aesthetic value of a beautiful view or outlook across an area of natural beauty.

What does this Local BAP contain?

The Local Biodiversity Action Plan for Portlaoise contains:

- a written report with maps, which documents the Biodiversity highlights of the town of Portlaoise.
- A number of actions that can reasonably be achieved in Portlaoise within a set timeframe
- Some goals and aspirations to be achieved by the Portlaoise Tidy Towns Committee and the wider community of the town.

4. Local Context

Location

Portlaoise is the county town of Laois, centrally situated within both Co. Laois and Ireland. The town has a unique and fascinating history with its foundation as “Fort Protector”, a plantation settlement on the Triogue river five centuries ago. Some of Fort Protector’s walls remain hidden away unnoticed at the back of Portlaoise’s Main St with the Triogue river still flowing quietly close by.

The aerial image is dominated by the grey of the built landscape as would be expected in a large town. However, there are plenty of green pockets dotted throughout the town as Old St. Peter’s graveyard illustrates in Figure 2. With a bit of help, biodiversity can thrive in areas such as these.

The town serves a large agricultural hinterland and the green and brown fields of agricultural land are clearly visible around the town’s edges in the aerial image in Figure 3.



Figure 2: The graveyard of the old St. Peter’s Church on Church Street.

This peaceful, green oasis is a short walk from the Main Street of Portlaoise.



Figure 3: A recent aerial image of Portlaoise showing the areas of interest

Source: extracted from www.bing.com/maps

The river Triogue itself is a green corridor cutting right through the centre of the town. Natural corridors such as the Triogue are of huge importance to biodiversity in an urban situation. Linear landscape features such as rivers, hedgerows and treelines provide lengths of shelter and foraging opportunities for many species of wildlife. They are reservoirs of trees, shrubs and wildflowers providing nesting areas, shelter and food for a wide variety of birds, small mammals, insects and other invertebrates (Figure 4). Another very important function is the fact that they provide links between green areas. An example of this is the Triogue providing a nature corridor between the People's Park in the south of the town and the Linear Park in the north of the town.

Portlaoise has many old and new buildings as well as mature gardens which in themselves can be habitats for rare and threatened species. Like many other towns and villages, Portlaoise features prominent open, grassy areas some of which may be suitable for promoting biodiversity through planting with wildflowers and native species of tree and shrub.



Figure 4 The River Triogue in the centre of Portlaoise.

Figure 5 illustrates the various habitats of the Portlaoise area and these are also listed in Table 1. Many are commonly found and some are of a high biodiversity value. The dominant brown colour of the map represents areas of built land as would be expected on a habitat map of a large town. These areas are not necessarily biodiversity deserts! Private gardens are included in this category and they can provide great habitat for trees, birds and pollinating insects.

The centre of Portlaoise is home to a small group of Swifts whose familiar screaming call can be heard on Main Street in the summer months. These birds' return in mid-May is a welcome sign that summer has arrived in the town each year. Swifts rely on old buildings for their unorthodox nesting methods and their numbers are declining across Europe as old buildings disappear or are refurbished with no gaps under their eaves! More details on a Swift Conservation project are in Appendix 2 of this Plan.

The habitat map shows many orange coloured patches which represent areas of open grassland including the two public parks: the People's Park on the Timahoe Road and the Linear Park just off the Ridge Road. These parks are highly important reservoirs of biodiversity as well as adding to the quality of life for the Portlaoise community with several pleasant walks that are easily achievable from the centre of the town.



Figure 5: Habitat map of Portlaoise

Table 1: Habitats present in the Portlaoise area (Habitats classified according to Fossitt 2000)

Code & description (Fossitt 2000)	Habitat in Figure 4	Local biodiversity value
BL3 Buildings & artificial surfaces	Built land and gardens	Medium
BL1 Stone walls & other stonework	Built land and gardens	Medium
GA1 Improved agricultural grassland	Agricultural grassland	Low
BC1 Arable crops	Agricultural grassland	Low
WL1 Hedgerows	Hedgerows	High
FW4 Drainage ditches	These are often found at the base of hedgerows	High
GA2 Amenity grassland	<ul style="list-style-type: none"> • Public open grassland • Playing fields (places where grassland would be fertilised/improved) • Golf Course • Cemetery/Graveyards 	Low
WS1 Scrub	Scrub/Woodland – there are several small areas of scrub verging on woodland depending on the proportion of mature trees dotted around the edges of Portlaoise.	High
ED Disturbed ground	<ul style="list-style-type: none"> • Disturbed ground – this category covers several areas throughout Portlaoise – often where building projects were started but then ceased and the disturbed ground has been recolonised with plants naturally. • Quarry 	Medium
FW2 Depositing/lowland rivers	Triogue river	High
FL8 Other artificial lakes & ponds	Open water	Medium

Enhancement of Biodiversity in Portlaoise

In an urban environment, areas of amenity grassland often provide opportunities to enhance the biodiversity value of the town. Portlaoise has many areas of open, public grassland (orange areas in Figure 5) several of which could host pockets of wildflower meadows or small groups of native trees and shrubs.

The Tidy Towns Committee is keen to do some work in various areas to conserve, enhance and raise awareness of biodiversity and actions to be undertaken are listed in Table 2: Actions for biodiversity in Portlaoise, with further details in Appendix 1.

In some cases, as seen in the Linear Park, wildflowers are already doing well (Figure 6). These can be encouraged in many areas, if desired, simply by slightly altering the grass-mowing regime. Many of these flower species originally grew in woodlands and therefore they flower in April-May before the leaves come on the deciduous trees. Many will have set seed before mid-May, therefore if the first cut of grass is left until mid-May annually, these areas will feature many beautiful flowers of great biodiversity value before long.



Figure 6: The Linear Park, Portlaoise with an inviting mown grass path between areas of wildflower meadow and trees.

In 2015, Laois County Council carried out an improvement project in Páirc an Phobail, which has included many measures to improve the area for wildlife and to increase biodiversity awareness including woodland walks, interpretative panels about the wildlife to be found in the Park and a tree trail featuring native trees. Another feature is the creation of an Outdoor Classroom beside the lake, where schoolchildren and adults will be able to study surrounded by biodiversity.

A bug hotel was constructed by local school children with the assistance of the Irish Wildlife Trust Laois-Offaly Branch and the Laois Branch of BirdWatch Ireland, working with the Portlaoise Men's Shed and Portlaoise Tidy Towns.



Figure 7: Exploring wildlife and building a bug hotel at Páirc an Phobail, Portlaoise

Areas of improved agricultural grassland arable crops (coloured pale green on Figure 5) are of low biodiversity value because they are generally devoted to a sole crop of grass and therefore the variety of wildlife supported by that habitat is low. However, as mentioned above the nature corridors of hedgerows, ditches and drains that separate these fields are of high biodiversity value.

Portlaoise also features several areas of open water. All of these are artificial ponds and lakes, the majority of which are associated with housing developments. Some have developed well with a good diversity of plant and tree species around their edges such as the lake in Páirc an Phobail and Kilminchy Lake (Figure 8). Others such as the pond at the entrance to Esker Hills need some management (Figure 9).



Figure 8: The Lake at Kilminchy.



Figure 9: The large pond at the entrance to Esker Hills housing estate.

5. Actions for Biodiversity

This LBAP proposes a list of actions achievable through community effort within a timeframe of five years (2015-2019). The locations for these actions in Table 2 below, are shown in the map in Fig. 8. The practical details of how and where to achieve these aims are further described in Appendix 1.

Table 2: Actions for biodiversity in Portlaoise

Action no.	Action	Location for Action	Locations on map in Fig. 8
1	Erect bird boxes. As there is a good population of swifts in Portlaoise already, consideration should be given to a project that identifies suitable places to erect swift boxes in the town	On trees in public areas such as green spaces and both public parks. Also in Old St Peter's Graveyard.	A: Old St. Peter's Graveyard, Railway Street. B: Grass area near junction of Well Road & JFL Ave
2	Erect bat boxes	On trees in public areas, on buildings with owner's agreement and in Old St Peter's Graveyard.	A: Old St. Peter's Graveyard, Railway Street
3	Bird feeders	On trees in public areas such as green spaces and both public parks. Also in Old St Peter's Graveyard.	A: Old St. Peter's Graveyard, Railway Street B: Grass area near junction of Well Road & JFL Ave
4	Plant biodiversity enhancing flowerbeds & pots	Several locations around town centre: flowerbeds and pots in Lyster Square, Market Square & Fitzmaurice Place. Larger beds such as at the junction of JFL Avenue & Abbeyleix Road, and the northern entrance to town (N80.)	B: Grass area near junction of Well Road & JFL Ave

Action no.	Action	Location for Action	Locations on map in Fig. 8
5	Construct Bug Hotels, building on the experience of the new bug hotel built in Páirc and Phobail during summer 2015.	An ideal project for school children to be involved with. Any spot where the public can see them and learn of their importance.	<p>C. Town Centre including Lyster Square, Fitzmaurice Place & Market Square</p> <p>D. Large flowerbeds near junction of Abbeyleix Road & JFL Avenue</p> <p>E. Esker Hills pond</p> <p>F. Raised flowerbed beside the roundabout on the N80 near Fairgreen Shopping Centre & Petrol Station</p>
6	Plant wildflower meadow	This may be possible in some of the many open grass areas around the town where local residents are interested. Even just a section of some of these Green areas would be suitable.	
7	Plant native trees & shrubs	<p>Public green areas, any open grass areas where trees would not impair drivers' sight lines.</p> <p>The pond banks at Esker Hills could feature some native trees typical of waterside situations.</p>	<p>A. Old St. Peter's Graveyard, Railway Street</p> <p>C. Town Centre including Lyster Square, Fitzmaurice Place & Market Square</p> <p>D. Large flowerbeds near junction of Abbeyleix Road & JFL Avenue</p> <p>E. Esker Hills pond</p> <p>F. Raised flowerbed beside the roundabout on the N80 near Fairgreen Shopping Centre & Petrol Station</p>
8	Gather & sow local, native seed	All the local hedgerows.	A. Old St. Peter's Graveyard, Railway Street.
9	Organise a local Biodiversity Day	Portlaoise, perhaps Páirc an Phobail	

Action no.	Action	Location for Action	Locations on map in Fig. 8
10	Change the grass-mowing regime	Any of the areas of open grassland around the town.	A. Old St. Peter's Graveyard, Railway Street.
11	Use natural methods of pest & weed control	Everywhere if at all possible!	
12	Leave piles of leaves in quiet corners	Dark, quiet corners of public areas e.g. at the end of a hedgerow where there won't be any disturbance.	A. Old St. Peter's Graveyard, Railway Street.
13	Biodiversity-friendly hedgerow maintenance	Everywhere if at all possible!	
14	Biodiversity data gathering	Anywhere in the Portlaoise area especially places with most diverse habitats e.g. the public parks, along the Triogue or at Kilminchy Lake. Private gardens are also great.	
15	Monitor local area for invasive species & control where necessary	Anywhere in the Portlaoise area.	



Figure 10: Aerial view of Portlaoise showing locations of interest (see Table 3 for location key).

Table 3: Key to locations identified on Figure 3.

Location	Name/Description of location
A	Old St. Peter's Graveyard, Railway Street.
B	Grass area near junction of Well Road & JFL Ave
C	Town Centre including Lyster Square, Fitzmaurice Place & Market Square
D	Large flowerbeds near junction of Abbeyleix Road & JFL Ave
E	Esker Hills pond
F	Raised flowerbed beside the roundabout on the N80 near Fairgreen Shopping Centre & Petrol Station

6. Progress Review

The actions achieved through this Plan will be reviewed annually by Portlaoise Tidy Towns. This will ensure actions are realistically targeted and achieved and will also help in tackling any problems that arise.

Appendix 1: Details Biodiversity actions for Portlaoise

Action	Reason	Location(s)	Timeframe	Method
Erect bird boxes	Maintain & increase bird species in the local area. Create public awareness. Work with Laois Branch of BirdWatch Ireland to identify suitable sites for erection of Swift nest boxes.	In public spaces where there are trees; in private gardens where the landowner is in agreement. In Old St Peter's Graveyard. In both public parks.	Years 1-5	See Appendix 2 below and accompanying information. With Portlaoise already hosting a small population of Swifts (<i>Apus apus</i>), the erection of Swift boxes in particular may enhance their numbers in the town.
Erect bat boxes	Maintain & increase bat species in the local area. Create public awareness.	In public spaces where there are trees; in private gardens where the landowner is in agreement. In Old St Peter's Graveyard.	Years 1-5	See Appendix 2 below and accompanying information. Why not launch the bat boxes with a community 'bat walk'? Contact Bat Conservation Ireland for ideas (www.batconservationireland.org).
Bird feeders	Help increase bird numbers. Create public awareness.	Install bird feeders where people can watch from a distance e.g. near benches in the public parks; in the graveyards & the cemetery and public spaces where they can be seen from benches.	Years 1-5	Free if voluntary labour and recycled materials are used. See www.rspb.org.uk and www.birdwatchireland.ie for designs. Ongoing maintenance through cleaning and re-stocking the feeders is very important.

Action	Reason	Location(s)	Timeframe	Method
Plant biodiversity enhancing flowerbeds & pots	Increase both plant and invertebrate biodiversity. Perennial plants decrease both cost and labour in the long-term as they rule out the need to buy new plants each summer. Taking care with what species are planted is very important for maintaining & enhancing bee and other pollinator species populations.	Several locations around Portlaoise town centre including flowerbeds and large pots in Lyster Square, Market Square & Fitzmaurice Place. Also larger beds such as at the junction of JFL Avenue& Abbeyleix Road and at the main northern entrance to town on the N80.	Once-off action within the 5 year timeframe, preferably early on so as to enjoy the lovely results sooner!	See list of suitable plants in Appendix 3. Native species are always best for maximising biodiversity and avoiding possible invasive species. Once planted, these perennial plants will continue to grow each year and many can be split and propagated as they get bigger – proving even better value! Also they provide good ground coverage, thus leading to less weeding work.
Construct more Bug Hotels	Maintain & increase invertebrate (butterflies; moths; beetles; bees; hoverflies; ladybirds; woodlice; lacewings etc.) species in the local area. Many of these species are very helpful to us humans through pollination, pest control and detritus removal! Bug hotels are excellent ways of creating awareness and public interest in biodiversity.	There is already a bug hotel in the park – another could be constructed in any spot where the public can see it and learn about the importance invertebrates An ideal project for school children to be involved with. Any spot where the public can see them and learn of their importance. Where possible, a small information sign highlighting the purpose and some of the occupants of the bug hotel would be helpful (Figure 11).	Years 1-5	Free – recycle materials and ask some volunteers to construct. A great project for children as they can use their imagination (see Fig 9 for examples).

Action	Reason	Location(s)	Timeframe	Method
Plant wildflower meadow	<p>Increase both plant and invertebrate biodiversity</p> <p>N.B. It is imperative that any wildflower seed bought is from native Irish stock, there are a few Irish businesses doing this but many sell foreign-sourced seed which will affect our native wildflowers through cross-pollination and possibly introducing new diseases and invasive species – so beware and be aware!</p>	<p>This may be possible in some of the many open grass areas around the town where local residents are interested. Even just a section of some of these Green areas would be suitable. See Appendices 4 & 5 for further details.</p>	<p>Once-off action within the 5 year timeframe, preferably early on in order to enjoy the beautiful results sooner!</p>	<p>The topsoil and turf layer will need to be stripped (to stop hungry grasses competing with your wildflowers) but once planted a wildflower meadow requires very little maintenance, just 2 mowings a year, first in late June/early July and the final cut in August or September, once the seed has had time to develop and scatter.</p> <p>Bulb meadows are a variation of the wildflower meadow (Figure 12). These are wildflower meadows with bulbs such as daffodils and tulips also planted. The bulbs flower in spring before the wildflowers, thus they lengthen the period of aesthetic interest but also more importantly they provide vital flowers early in the season for the insects that emerge from hibernation early e.g. queen bumble bees starting up new colonies.</p>

Action	Reason	Location(s)	Timeframe	Method
Plant native trees & shrubs	Everyone loves trees! Ensuring the plants are indigenous species from native stock ensures both biodiversity value and plant disease influx (think of Ash dieback disease!).	Public green areas. Any open grass areas where trees would not impair drivers' sight lines. The pond banks at Esker Hills could feature some native trees typical of waterside situations.	Once-off action within the 5 year timeframe.	Free if next action is followed! Groups of trees (even 3-5 in small areas) are preferable to single trees. Do not use herbicides, use tree tubes as an alternative. Remove adjacent competing weeds (by hand!) and lots of water in the early years. Typical waterside trees include the decorative 'weeping' varieties of Ash (<i>Fraxinus excelsior</i> 'Pendula') and Willow (<i>Salix x chrysocoma</i>). Also consider the native trees of damp ground: Downy Birch (<i>Betula pubescens</i>); Silver Birch (<i>Betula pendula</i>); Quaking Aspen (<i>Populus tremula</i>) and Alder (<i>Alnus glutinosa</i>).
Gather & sow local, native seed	Ensuring the plants are indigenous species from native stock ensures both biodiversity value and control of plant disease spread.		Years 1-5	Free if compost & pots are donated – old paper-based milk cartons work well

Action	Reason	Location(s)	Timeframe	Method
Organise a local Biodiversity Day	To increase local awareness of the importance of biodiversity. This can also result in recruitment of more local volunteers	Páirc an Phobail, Portlaoise has already hosted several successful biodiversity events and would be an ideal location for a community biodiversity day, in association with Laois County Council.	A once-off event, however, sometimes they prove popular with the local community and turn into annual events!	Ideas and guidelines can be obtained from the National Biodiversity Data Centre (NBDC)(www.biodiversityireland.ie). Even if your community doesn't get to organise a Biodiversity Day, the NBDC are keen to receive any wildlife records made by the public either at their website or through their newly launched app.
Change the grass-mowing regime by: (a) delaying the annual first cut to early May; (b) only mowing half the width of the roadside verges	This encourages biodiversity by allowing wildflowers such as Cow parsley & Cowslip to flower and set seed for more flowers next year.	Any of the areas of open grassland around the town.	Every year	No extra cost. Just delaying the first cut of the year until mid-May can help wildflowers to set seed or as is often seen mowing <i>around</i> the cowslips and leaving them uncut results in more pretty flowers in subsequent years. Ideally leave the first cut until July with a second cut at the end of August, however, paths could be mown through – Old St. Peter's Graveyard would be an ideal spot for this management. A small sign saying 'Left unmown for wildlife' will allay any misunderstandings about untidiness!

Action	Reason	Location(s)	Timeframe	Method
Use natural methods of pest & weed control	Pesticides and herbicides decrease biodiversity and leave residual chemicals in the soil which continue to reduce biodiversity into the future. Also they can be lethal for predators (e.g. Barn Owls) that ingest large doses through their prey (rats & mice).	Various different methods of natural pest control have been found to be successful. Encouraging natural methods of pest control throughout an area especially amongst private gardens would increase the local area's biodiversity.	Every year	Most methods are free but require manual labour e.g. weeding by hand. It is possible to make a mix with vinegar and salt, however, it has to be very carefully applied as it is indiscriminate in the plants it kills. Also the salt in the mixture sterilises the soil for two years i.e. destroying the soil's biodiversity and making it unsuitable for growing anything – not advisable! Therefore this is only suitable for removing weeds from the gaps between paving slabs/bricks.
Leave piles of leaves in quiet corners	For hibernating hedgehogs. The resulting leaves can be used by whoever needs it as a mulch the following spring, when hibernating hedgehogs have awoken.	Dark, quiet corners of public areas e.g. at the end of a hedgerow where there won't be any disturbance.	Every year	Free

Action	Reason	Location(s)	Timeframe	Method
Hedgerow maintenance	When hedgerows are maintained properly, e.g. cut once every three years they produce maximum crops of flowers and fruit which are not only aesthetically pleasing to the eye but are also highly important for pollinators and for nesting, roosting and feeding wildlife. N.B. Hedges need to be at least 2.5m high for them to be good nesting habitat.	All hedgerows around the town.	Every year	See Appendix 4 below for maintenance details.
Biodiversity data gathering	With increases in biodiversity in the community it will be very interesting to record species. This process is easily facilitated now with many helpful websites. Local community recording is an invaluable tool for getting nationwide pictures of how particular species are doing.	Anywhere in the Portlaoise area especially places with most diverse habitats e.g. the public parks, along the Triogue or at Kilminchy Lake. Private gardens are also great.	Every year. Anyone with an interest can take part from children to grown-ups of all ages.	Birdwatch Ireland co-ordinates a 'Garden Bird Survey' every year (see www.birdwatchireland.ie). The National Biodiversity Data Centre are keen to receive any wildlife records made by the public either at their website or through their newly launched app (see www.biodiversityireland.ie). The National Parks & Wildlife Service welcome records too (see www.npws.ie).
Monitor local area for invasive species	Damaging invasive species are an increasing problem for Ireland's native biodiversity	Anywhere in the Portlaoise area.	Every year. Anyone with an interest.	See Appendix 6 and www.biodiversityireland.ie for further details.



Figure 11 Examples of 'Bug Hotels' re-using various materials

The photo also shows a good example of the all-important information notice written here by pupils of Holy Trinity School Donaghmede, Co. Dublin.



Figure 12: Bulb meadow at Tullynally Gardens, Co. Westmeath.

Appendix 2. Bird & bat boxes

1. Bird boxes (nestboxes)

There are many different sets of instructions for bird box (nestbox) construction on the internet. The best examples are available from the Irish bird charity Birdwatch Ireland (www.birdwatchireland.ie) and the British bird charity the RSBP (www.rsbp.org.uk). Both websites contain detailed instructions for making nestboxes and where to site them. Instructions differ depending on which birds you are trying to attract. This LBAP focuses on Passerines (garden birds), Swifts and Raptors (birds of prey – specifically here the Kestrel and the Barn Owl). The most important points to remember when positioning the boxes are set out below. These points are a summary of advice from Birdwatch Ireland and the GMIT Swift conservation project. Please refer to their nestbox information leaflets which accompany this report if you are going to use them in your area.

1.1 Passerine nestboxes

- 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.
- Never nail the box to a tree, instead use a strap to ensure the tree is not damaged.
- Ensure there is a clear flight path to the entrance of the nestbox.
- Tilt the box forward slightly thus ensuring any heavy rain will hit the roof and bounce off rather than enter the box via the entrance hole/slit.
- Autumn is the best time to erect boxes as birds seek shelter in autumn and winter. Birds will often use the same box for nesting then the following spring.
- Don't put bird boxes and bird feeders near each other – otherwise the poor birds in the nestbox will spend all their time being territorial and chasing off the birds coming to the feeder!
- Don't use boxes with perches – birds don't use them and they can be an aid to predators.
- Avoid colourful, 'pretty' nestboxes - these are nice as garden decorations but impractical for wild birds.
- Nestbox design varies depending on which species you are hoping to attract. See the accompanying leaflets for details e.g. hole size varies from 25mm width up to 45mm depending on whether you want to attract Blue tits or Starlings and several other species in between.

1.2 Swift boxes

Screaming Swifts performing aerial acrobatics was a common summer sight over Ireland's towns and villages, however, their Irish population has declined by over 40% in the last 15 years. This decline has put the Swift on the amber list of Birds of Conservation Concern in Ireland. Swifts preference is to nest in high, old buildings where they gain access to the ledges on top of walls just under roof

eaves and fascia boards. There is a population of swifts in the centre of Portlaoise at present, and another great Laois example is the group of Swifts (descriptively known as a 'swoop' or a 'drift' of Swifts!) nesting in the spire of St. Fintan's Church in Mountrath. Many of their preferred nesting sites have been lost in recent years between either the loss of old buildings or their restoration where new techniques mean there are no gaps in fascias anymore.

GMIT Mayo campus in Castlebar has established a Save Our Swifts Project and installed nest boxes for Swifts with the aim of providing additional breeding sites for Swifts and to raise awareness. Securing the future of Swifts by protecting existing nest sites and providing new sites by erecting nest boxes is a very affordable and achievable project for town and village communities to work on. Their information leaflet is included in the information pack that comes with this LBAP.

1.3 Kestrel nestboxes

The following points about Kestrel and Barn Owl boxes are summarised from an information leaflet kindly provided by John Lusby of Birdwatch Ireland. The full leaflet accompanies this LBAP and Birdwatch Ireland appreciate being told if your community decides to erect one of these boxes so they can provide advice and guidance and keep track of any future inhabitants!

- Although boxes can be installed at any time of year, it is best to have Kestrel boxes in place by mid-March if there is to be a chance that they might be used in the summer of that year.
- Face the box away from the prevailing winds (so generally, face the box toward the north or east).
- The box can be placed in a barn, an old building or shed, or on a tree.
- Put the box at least 20 feet from the ground if possible.
- Put the box away from occupied houses, roads, or any other area where people visit regularly. The quieter, the better.
- Don't "hide" the box. Make sure the box is visible to a passing Kestrel. If the box is in a tree, trim away branches at the entrance so that birds have a clear flight path to the box.

1.4 Barn Owl nestboxes:

- Although boxes can be installed at any time of year, it is best to have Barn Owl boxes in place by mid-March if there is to be a chance that they might be used in the summer of that year.
- Barn Owl nest boxes are bigger and heavier than Kestrel boxes and great care is needed during their installation. Two people and two ladders might be necessary to install it. Take all safety precautions.
- Barn Owls won't tolerate regular human intrusion into their nesting area. Be sure to place the box at a site well away from normal human activity, machinery, etc.
- Suitable sites include disused barns, derelict or ruined houses or other buildings, or disused sheds.
- Put the box at least 15 feet from the ground if possible.

- Many Barn Owls are struck by cars, so place nest boxes well away from busy main roads.
- Barn Owls also prefer two or more access points to their nest, if possible, and the entrances to the building (window, door, hole in wall, etc.) should be high up, not only at ground level.
- Nest boxes are more likely to be used if there is also good hunting habitat very nearby (rough grassland, woodland edge, marsh or river edge, thick hedgerow).

2. Bat boxes

Ireland hosts nine different species of bat, two of which were only discovered in Ireland in recent years. These mammals are fascinating creatures who have unfortunately suffered from several myths associated with them. For instance:

- Irish bats do not suck blood! They are insectivores feeding exclusively on insects especially midges who do suck our blood and cause general annoyance on damp summer evenings. One bat can eat 5000 midges per night providing us humans with a great ecosystem service!
- Bats are not like flying mice. Unlike mice, bats give birth to just one baby bat each summer. This means they are very susceptible to population drops when bad luck such as a bad summer weather results in not enough food or warmth to keep that baby alive.
- Bats are not blind. They are active at night in the summer and they navigate and catch their food using a form of sonar known as echolocation. This is a fascinating process where the bats make very high pitched squeaks and listen for the echoes which bounce off obstacles or potential prey. The bats can use these echoes to determine a huge amount of information about what is around them in the dark. These squeaks are too high-pitched for human ears so machines known as 'bat detectors' are used to listen in to these calls and thus determine what species of bats are present.

Bat Conservation Ireland is a charity which works to spread the fascinating story of Irish bats through education and conservation. They can be contacted at their website (www.batconservationireland.org) which also contains lots more information. Their 'Bats & Tidy Town Projects: Guidance notes for Tidy Towns Committees' leaflet can be found on their website and is included in the information pack that comes with this LBAP. The points below are summarised from this leaflet.

- Bat Boxes are artificial roosts erected to encourage bats to roost in areas where few roosts are present. Bat boxes can be made from various materials from untreated timber to woodcrete (combination of sawdust and concrete). Each bat species require different spaces to roost in. Therefore, bat boxes come in various shapes and sizes. The microclimate within a bat box is a very important factor. In general, they prefer warm spaces in the summer for rearing young and cooler spaces in the winter for hibernation.
- The bat box should be draught proof and made from a thermally stable material such as untreated wood, woodcrete, brick or stone. If possible, it is better to provide several internal chambers or several types of bat boxes in different locations so that the bats can move around as their needs change.

- Bat boxes are more likely to be used if positioned where bats are known to feed. If you see bats zipping around in the evening in particular areas, then these areas would be a good place to position bat boxes. Bats, in particular, like hedgerows and treelines to commute along and will feed over ponds.
- Bat boxes should be located as high as possible (at least 4m off the ground) in sunny spots but areas that are sheltered from the wind.
- If erecting on a mature tree, choose one that has a clean bark (no ivy) with no branches for 1m radius around the location of the box.
- Because timber boxes will only last up to 5 years open to the weather, BC Ireland recommends that woodcrete boxes are used on external surfaces and Timber bat boxes are used inside buildings.
- If erecting on a building, erect as close as possible to the eaves of the building, on a south-facing wall and, if possible, on a building located adjacent to a treeline or hedgerow.
- Bat boxes can also be erected inside a barn. This is an ideal location for timber bat boxes as it protects the bat box from wind and rain (thereby increasing the life span of a timber box, which can be as little as five years if erected on external surfaces) while providing a wonderful space for young bats to practice flying. It also provides a suitable space for bats to feed when weather conditions are poor.



Figure 13. Bat box on the east wall of St. Patrick's Hall, Ballacolla, Co. Laois



Figure 14. Two bat boxes on a tree at Abbeyleix Bog, Co. Laois

Appendix 3. Recommended species for planting

(a). Hedges

Using the local hedgerows as the cue for which species to plant, the following are recommended:

- Hawthorn/Whitethorn (*Crataegus monogyna*) – this should be the dominant species
- Elder (*Sambucus nigra*)
- Blackthorn (*Prunus spinosa*)
- Hazel (*Corylus avellana*)
- Crab apple (*Malus sylvestris*)
- Holly (*Ilex aquifolium*)
- Privet (*Ligustrum vulgare*)
- Spindle (*Euonymus europaeus*)
- Guelder rose (*Viburnum opulus*)



Holly leaves & berries



Crab apple in bloom



Guelder rose flowers



Guelder rose berries

Several Ash (*Fraxinus excelsior*) and Oak (*Quercus robur*) trees should also be planted along the hedges as mature trees every so often along the length of a hedge greatly add to its biodiversity value.

It is very important that all the plants are sourced in Ireland and locally if at all possible as this ensures the plants will be adapted to the local conditions and the genetic make-up of local native plants will not be disturbed. One method of ensuring this would be to collect seed from local plants and grow them for planting. This is not always practical as it would mean the hedge could not be planted for several years. However, this method could be used particularly in the collection of local Ash and Oak seed and it would make an ideal project for local schoolchildren to become involved in. A point to note here is that if you do source your trees and shrubs from a nursery always make sure to ask if the plants are sourced in Ireland – in addition to helping you find an Irish supply it will also raise awareness amongst nurseries of the importance of this factor.

(b) Wildlife-friendly tree species

Trees recommended for planting are:

- Pedunculate Oak (*Quercus robur*) – prefers neutral/limestone soils
- Sessile Oak (*Quercus petraea*) – prefers slightly acid soils
- Willow (*Salix* spp) – good for damp/ waterside conditions
- Hazel (*Corylus avellana*) – likes neutral to limey soils
- Alder (*Alnus glutinosa*)– good for damp/ waterside conditions
- Aspen (*Populus tremula*)
- Silver birch (*Betula pendula*)
- Downy birch (*Betula pubescens*) - good for damp/ waterside conditions
- Yew (*Taxus baccata*) – note that ‘*fastigiata*’ is the upright form (Irish Yew)
- Holly (*Ilex aquifolium*)
- Ash (*Fraxinus excelsior*)
- Rowan/Mountain ash (*Sorbus aucuparia*) – flowers and fruit for spring and autumn interest
- Whitebeam (*Sorbus aria*) – flowers and fruit for spring and autumn interest
- Crab apple (*Malus sylvestris*) – flowers and fruit for spring and autumn interest
- Wild cherry (*Prunus avium*) – flowers in spring and colourful fruit and leaves in autumn



Rowan/Mountain ash berries are favourites with the birds!

(c) Wildlife-friendly shrub species

- Fruit bushes e.g. the native Raspberry (*Rubus idaeus*) which grows very well in Laois. Also Currants and Gooseberries (*Ribes* spp.).
- Ling heather (*Calluna vulgaris*) - prefers acid/peaty soil conditions
- Bell heather (*Erica cinerea*) - prefers acid/peaty soil conditions
- Broom (*Cytisus scoparius*) terrific colour, blooming through April & May.
- Cotoneaster (*Cotoneaster horizontalis*)* - good ground cover, particularly on sloped beds
- Firethorn (*Pyracantha*)* - a very thorny climber, good for wall cover with creamy blossoms in summer and colourful berries in autumn. Different species have different coloured berries ranging from yellow through orange to scarlet red.
- Honeysuckle/Woodbine (*Lonicera periclymenum*) – a climber with beautifully scented flowers, particularly in the evening when they attract nectar-seeking moths.
- Dog rose (*Rosa canina*) – a climber with beautiful flowers in June and red rosehips in autumn.
- Buddleia (*Buddleia davidii*)* - butterflies love this shrub
- Elder (*Sambucus nigra*) – creamy flowers (most important ingredient in a very tasty cordial!) in June and black berries in autumn (also edible, great for jams and jellies)
- Spindle tree (*Euonymus europaeus*) – strikingly beautiful orange seeds carried in bright pink capsules called ‘cardinals’ hats’
- Blackthorn (*Prunus spinosa*) – featuring sloe berries in autumn
- Purging Buckthorn (*Rhamnus catharticus*) – an uncommon shrub – the favourite food plant of the Brimstone butterfly
- Alder-buckthorn (*Frangula alnus*)
- Privet (*Ligustrum vulgare*)
- Guelder rose (*Viburnum opulus*) – beautiful flowers and berries, see pictures above.
- Gorse (*Ulex europaeus*) – the heady, coconut aroma of its bright yellow flowers is the smell of an Irish summer’s day.

*indicates a species not native to Ireland but non-invasive and wildlife friendly



Elder bush in full bloom



Broom in the wild

(d) Wildlife-friendly herbaceous species

Avoid F1 hybrids as these are sterile i.e. have no pollen and therefore no use to many insects. Also avoid double-flowered varieties as they can inhibit pollinators)

- Yarrow (*Achillea millefolium*)
- Ornamental Daisies (*Aster* spp)*
- Marigold (*Calendula officinalis*)*
- Poppy (*Eschscholzia* spp)*
- Sunflowers*
- Lady's mantle (*Alchemilla mollis*)
- Granny's bonnet/Columbine (*Aquilegia vulgaris*)
- Lovage (*Levisticum officinale*)*
- Baby blue eyes (*Nemophila menziesii*)*
- Thyme (*Thymus praecox*)
- Lavender (*Lavandula*)*
- Honesty*
- Foxglove (*Digitalis* species)
- Snapdragon (*Antirrhinum*)*
- Cosmos*
- Globe thistle (*Echinops*)*
- Forget-me-not (*Myosotis* spp)
- Evening primrose (*Oenothera*)*
- Selfheal (*Prunella vulgaris*)
- Sedum*
- Tutsan- a native small shrubby plant with bright yellow flowers in summer and red berries in autumn.
- *Geranium* species, also known as Cranesbills (the herbaceous, hardy perennials - not Pelargoniums)

*indicates a species not native to Ireland but non-invasive and wildlife friendly



Hardy Geraniums growing with roses in a flowerbed



Sedum blooms covered with Small Tortoiseshells



Aquilegia in the wild



Foxglove



Tutsan (*Hypericum androsaemum*)

Appendix 4. Hedgerow Maintenance Tips

Adapted from Biodiversity guidelines produced by Galway County Council (for details see www.galway.ie/biodiversityguidelines) and guidelines of The Hedge Laying Association of Ireland (see: www.hedgelaying.ie)

- With certain exemptions (not including local community groups) the Wildlife Amendment Act (2000) prohibits the cutting of hedges during the period 1st March to 31st August (inclusive)
- Where necessary, trim or lay while dormant, from the beginning of September to the end of February
- To keep the base dense, trim hedges so that they are wider at the base and narrower at the top
- Always bear in mind that hedges need to be at least 2.5m high to provide the best nesting habitat for birds.
- Hedges that are trimmed every year produce much less flowers and fruit than those cut less frequently. It is recommended that a length of hedge be cut once every three years. This could be done either by leaving a whole length of hedge uncut for three years or the usual method is cut one length in Year A, the next length in Year B, the next length in Year C and then it's back to the length that was cut in Year A and the process continues. Trimming hedges once every three years results in maximum flowering and fruiting of the shrubs in the hedges. Not only does this result in a more aesthetically pleasing hedgerow but it also makes for a hedge that will increase biodiversity locally as its fruit and flowers feed a wide diversity of local wildlife from bees to birds to mammals as well as the odd foraging human!
- Avoid the use of herbicides in general but especially within 1.5m of hedge.
- Store grass clippings away from the base of hedgerows. Grass clippings are often seen thrown in ditches around the country. This is not good environmental practice as the rotting grass prevents other plants from growing resulting in ugly, bare patches with poor biodiversity.



Two different management regimes along either side of a road. Which side is more attractive to the eye?

Appendix 5: Management Regimes for Various Habitats

Adapted from Biodiversity guidelines produced by Galway County Council (for details see www.galway.ie/biodiversityguidelines).

Grassland areas & road verges

- Leave grass in verges on the outskirts of your town/village less tightly mown
- Do not use herbicides or fungicides.
- Grass clippings need to be removed to an appropriate area for composting, not to a nearby ditch, where their rotting will actually burn and kill off the plants underneath leaving an ugly, unsightly patch.
- Leave areas for wildflowers, nettles etc. in quiet corners. Nettles are vital for over 40 species of insect including the caterpillars of the beautiful Peacock butterfly (see photographs below)
- Reduce mowing regime, in order to encourage wildflowers to flower and set seed. It is very important to leave mowing till after the wildflowers have finished flowering and their seed has dispersed otherwise they could disappear from an area altogether. Did you ever wonder why there are less cowslips and primroses now than there was in the past? Cowslips are actually doing well on motorway verges as these are only occasionally mown. Togher roundabout, outside Portlaoise at Exit 17 of the M7 motorway is a wonderful example with a huge patch of cowslips flowering every year on its western side.



Caterpillars of the Peacock butterfly, feeding on nettle.



The adult Peacock butterfly

Gardens, school grounds & open grassy areas and flower beds

- Try to plant native species of flowers, grass and trees which are best suited to your soil and landscape and local wildlife (see Appendix 2 for recommended list).
- Use only plants and seeds that have been grown in Ireland and if possible from your local area. Seed gathering projects could be organised in conjunction with local schools. Wildflower mixes are often seen for sale in shops and garden centres but most of these are not Irish so using these seed mixes can lead to the introduction of exotic and possibly invasive species. Another side effect is even if the species of plants in the seed mixes are the same as local wildflowers they will have different genetic make-up and if the foreign and native seeds interbreed then the strengths of the native seed source will be diluted.
- Avoid planting invasive exotic species such as Japanese knotweed, Himalayan balsam, Giant rhubarb (*Gunnera*) or Rhododendron. If you prune or remove invasive plants or clear excess oxygenating plants from your pond, compost or burn them to make sure they cannot invade nearby land or waterways.
- Aim for a mixture of species of plants to appeal to a range of animals i.e. flowers and herbs, shrubs and trees.
- Choose plants which are rich in nectar and pollen to attract insects (see Appendix 3).
- Choose plants with plenty of berries and seeds to provide food for birds (see Appendix 3).
- When planting/landscaping open areas, make a few different areas such as stone walls, log/wood piles, a hedge, flower area for nectar and pollen and very importantly a pond/area of open water. The latter provides drinking water for wildlife as well as habitat for other wildlife species such as frogs and dragonflies.
- Where you have birdfeeders ensure they are cleaned regularly as old food and dirt at feeders can be lethal to small birds. Also make sure your feeder is placed where cats cannot access it.
- Piles of leaves in quiet spots provide hibernating spaces for hedgehogs.
- Piles of logs and sticks of different sizes will attract all sorts of insects and small animals. Fill the gaps with moss and old leaves which are food for hedgehogs, birds and other animals.
- Bundles of twigs or straws provide nesting and hibernation spots for a range of insects including ladybirds and bumble bees.
- Where possible use peat free compost or at least peat-reduced compost. Better still make your own! For best results, get some good advice about composting before you start. The Laois Environment Awareness Officer Ann Marie Kelly runs Compost making clinics to help communities get started. She can be contacted at 057 8674331.
- Slug pellets and weed killer are very harmful to birds and hedgehogs. Try to use natural methods of pest and weed control.

Appendix 6: Invasive species identification, monitoring & control

In recent years several invasive species have been causing serious environmental problems in different parts of Ireland. Many of the problematic species are plants which originally would have been brought in to Ireland as exotic garden plants. The problems start when these species escape to the wild and take over, pushing out the native species in the process. A well-known example is *Rhododendron ponticum* which invades bogs and woodlands to the detriment of the native Irish flora and fauna – the evergreen shrub shades out the woodland flowers and herbs and they disappear in a few short years. An animal example is the American mink (*Mustela vison*). Mink were bred on mink farms for their furs for many years but then as the demand for furs declined many animals escaped or were released into the wild. Mink feed on other small mammals and birds, so in the wild they prey on native wildlife species to the detriment of Irish biodiversity.

In the Portlaoise area there are three main invasive species to be monitored:

- Grey squirrel
- American mink
- Japanese knotweed

Information sheets on these three species are supplied with this report. These sheets aid in the identification of the species and give instructions on what to do if they are recorded. The sheets are published by the National Biodiversity Centre and copies of the sheets and lots of other information are available at: www.invasives.biodiversityireland.ie

Appendix 7. Helpful Reading Material

- Aalen, F.H.A.; Whelan, K. & Stout, M. (eds.) (1997). *Atlas of the Irish Rural Landscape*. Cork University Press, Cork.
- Bord na Móna (2010). *Biodiversity Action Plan 2010-2015* (available to download at www.bordnamona.ie).
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- Praeger, R. L. (1937). *The way that I went*. (Published by the Collins Press, Cork in 1997).
- Tubridy, M. & Associates. (2010). *Laois Habitats Survey*. Report prepared for Laois Heritage Forum, County Hall, Portlaoise (www.laois.ie/heritage).

7. Appendix 8. Helpful Contacts, Organisations & Websites

Laois Tidy Towns Facilitator and Environment Awareness Officer: Ann-Marie Kelly, tel. 057 8674331
Laois County Council Heritage Officer: Catherine Casey, tel. 057 8664129
National Parks & Wildlife Service District Conservation Officer for Laois: tel. 076 1002590

- Abbeyleix Bog Project: www.abbeyleixbog.ie
- An Taisce: www.antaisce.ie
- Bat Conservation Ireland: www.batconservationireland.org
- Birdwatch Ireland: www.birdwatchireland.ie
- Laois branch of Birdwatch: www.facebook.com/pages/Birdwatch-Laois
- Bord na Mona: www.bordnamona.ie
- Botanical Society of Britain and Ireland: www.bsbi.org.uk
- Coillte: www.coillte.ie
- Coillte's raised bog restoration project: www.raisedbogrestoration.ie
- Conservation Volunteers: www.conservationvolunteers.ie
- Crann: www.crann.ie
- Dragonfly Ireland: www.habitas.org.uk/dragonflyireland
- Heritage Council: www.heritagecouncil.ie
- Irish Peatland Conservation Council: www.ipcc.ie
- Irish Seed Savers: www.irishseedsavers.ie
- Irish Wildlife Trust: www.iwt.ie
- Laois County Council, Heritage Office: <http://www.laois.ie/LeisureandCulture/Heritage/>
- Lichens: www.lichens.ie
- Lough Boora Parklands: www.loughbooraparklands.ie
- National Biodiversity Data Centre: www.biodiversityireland.ie
- National Parks & Wildlife: www.npws.ie
- The Ordnance Survey of Ireland: www.osi.ie/mapviewer
- Wildflowers of Ireland: www.irishwildflowers.ie

Appendix 9. Definitions & Explanations

1. **Biodiversity= the diversity of life**

The diversity of all the organisms that occur on Earth – everything from birds to bugs to mammals to trees to reptiles to lichens to fish to mosses to amphibians to algae.....

Biodiversity includes the diversity of:

- Individuals within a species (genetic diversity) i.e. you and me!
- Species within an ecosystem or habitat (species diversity) i.e. me and the spider on that wall!
- Ecosystems or habitats (habitat diversity) i.e. this building we're in and the fields outside.

2. **Ecology = The branch of Biology that deals with the relations of organisms (living things) to one another and to their physical surroundings.**

3. **What is the importance of Biodiversity and Ecology?**

Humans are an integral part of the Biodiversity of Earth and our actions can influence it in both a positive and negative way.

Ecology deals with the inter-relations between organisms and the places in which they live. This can refer to human beings' dealings and interactions with both the habitats and species around them. So Biodiversity and Ecology affects our lives every day without us even realising it!

4. **Species = a type of living organism**

- Members of the same species can interbreed
- All species have common names and scientific names (in Latin) e.g. Homo sapiens

5. **Habitat = simply means the home environment of an organism or a number of organisms**

- Some species only found in one type of habitat e.g. a whale only found in the sea
- Some species are found in a few habitats e.g. some grass species found in both open fields and woodlands

6. **Ecosystem = a community of organisms all interacting with each other**

Complex – it involves all sorts of different species and different groups of species e.g. in a woodland it includes: the birds nesting in the trees; the lichens living on the trees; the tree leaves rotting on the ground and the fungi living on them; the insects living in the trees (and the birds!) etc.....

7. **Ecosystem Services = all benefits humans receive from ecosystems**



www.laoistidytowns.ie