



# Local Biodiversity Action Plan

for

## Clonaslee, Co. Laois

By

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For

Laois County Council

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# 1. Acknowledgements

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Thanks to the Heritage Council for their support through the funding of this project. The project to write five Local Biodiversity Action Plans for communities in Laois in 2015 built upon the success of a project developed and implemented by Laois Partnership under the Rural Development Programme in 2013, when training in Biodiversity was rolled out across Laois and Local Biodiversity Action Plans were written by seven participating communities. Laois County Council is grateful to the Board and staff of Laois Partnership for their support in the initial project, and in sharing their experiences to allow the development of the project in 2015.

Thanks to Maura O'Gorman, John Troy and all of Clonaslee Tidy Towns Committee for welcoming the LBAP project to Clonaslee and for all the hard work they do in their local area.

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 Clonaslee community and Laois County Council with the support of the Heritage Council. Dr Fiona Mac Gowan met with the Clonaslee Tidy Towns representatives in April 2015 on behalf of the County Council to devise this plan. The meeting involved a walkabout of the Clonaslee 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 when Kearney Consultants and Trainers Ltd in association with Dr Fiona Mac Gowan were commissioned 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 Clonaslee 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 Clonaslee:



Oak



Mallard & ducklings



Cowslip

#### What is the importance of Biodiversity & Ecology?

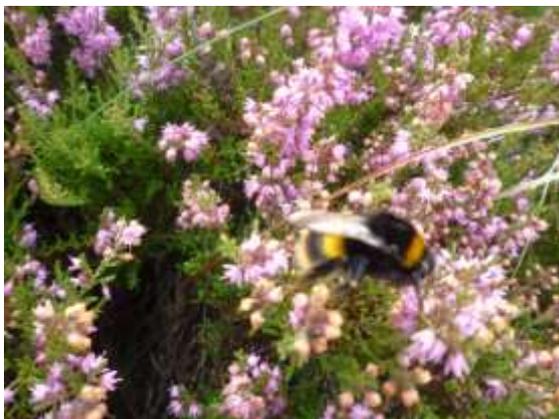
Humans are an integral part of the Biodiversity of Earth and our actions can affect it in both a positive and negative way.

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.

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

So Biodiversity and Ecology affect our lives every day without us even realising it!



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 unmown to enhance wildflowers which will provide food for insects (Figure 1); reducing the use of pesticides 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](http://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 contains a written report with maps, which documents the Biodiversity highlights of the village of Clonaslee
- The plan describes a number of actions that can reasonably be achieved in Clonaslee, within a set timeframe
- It also sets out some goals and aspirations to be achieved by the Tidy Towns Committee and the wider community

## 4. Local Context

### Location

Clonaslee is a small town beautifully situated in north-west Laois in the foothills of the Slieve Bloom Mountains. This proximity to the mountains dominates the atmosphere and landscape character of the town marking it out as different from other towns in the county (See Figure 2).

As the aerial image in Figure 3 shows, the town is surrounded by the green of agricultural land and most notably woodland. These woodland areas are publicly accessible for the most part and provide a wonderful walking amenity for the local community. These woodlands belong to the Slieve Bloom Mountains Special Protection Area (SPA) which is a conservation designation of Europe-wide importance under the E.U. Birds Directive. This means these woodlands are protected under European law for their importance as habitat that supports the life-cycle of the rare and endangered Hen Harrier (*Circus cyaneus*). The Slieve Bloom Mountains are a stronghold of the decreasing Irish Hen Harrier population.



Figure 2: The river Clodiagh at the bridge on the Main Street of Clonaslee. The river banks and the wall on the right are rich with plant life.



Figure 3: A recent aerial image of Clonaslee showing the areas of interest (source: modified by the author from [www.bing.com/maps](http://www.bing.com/maps)).

Figure 3 shows how the hedgerows and treelines around the town connect up different areas and provide ‘nature corridors’ which are most important for biodiversity. Clonaslee is also blessed with not one but two rivers: the Clodiagh and the Gorragh. Both rivers begin their journey up in the Slieve Blooms with the Gorragh running into the Clodiagh north of Clonaslee. The Clodiagh runs on then for many kilometres until it flows in to the River Shannon north of Banagher in Co. Offaly. The Clodiagh and Gorragh are also important nature corridors adding to the diversity of habitats in the Clonaslee area. Clonaslee 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, Clonaslee 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 illustrates the various habitats of the Clonaslee area and these are also listed and described in Table 1. Many are commonly found and some are of a high biodiversity value. Hedgerows are an example which not only provide food and shelter to wildlife, they also provide the all-important ‘nature corridors’ that facilitate the movement of many species of wildlife from one area to another away from the watchful eyes of predators. The vast majority of hedgerows in Ireland are old and in many cases they are the main reservoirs of native indigenous seed for species of trees, bushes and wildflowers that are best suited to growing in a particular area.

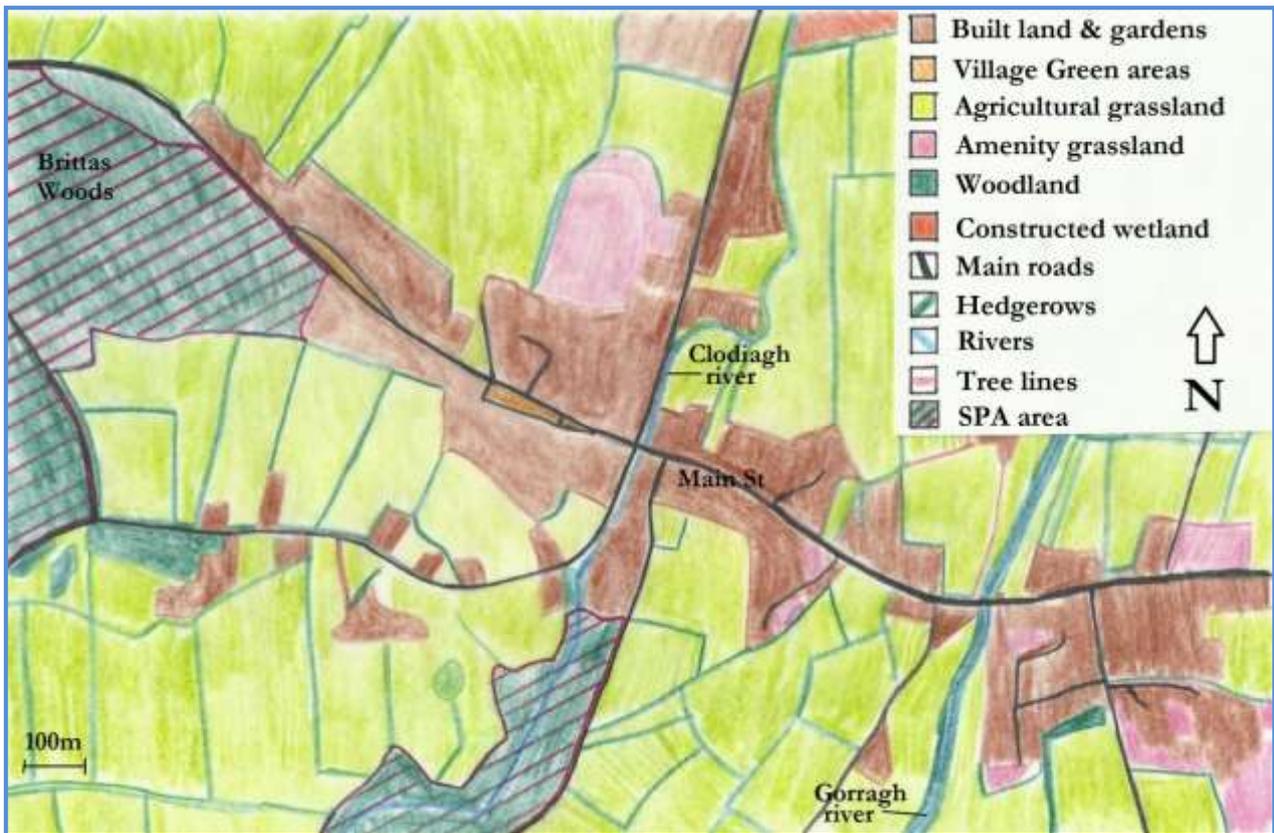


Figure 4: Habitat map of Clonaslee.

The habitat map shows several areas of woodland around the town. These are highly important reservoirs of biodiversity as well as adding to the quality of life for the Clonaslee community with several pleasant woodland walks that are easily achievable from the centre of the town.

The habitats of Clonaslee were documented as part of a large study commissioned by Laois Heritage Forum and published as the Laois Habitats Survey 2010 (Hickey & Tubridy 2010). This report is available online from Laois County Council’s website [www.laois.ie/heritage](http://www.laois.ie/heritage). The report highlights the importance of the many hedgerows and the rivers Clodiagh and Gorragh around Clonaslee forming vitally important nature corridors known as Ecological Network Features. These link up the different habitats leading from open countryside like the many fields to areas of shelter and food like Brittas Wood.

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

Code & habitat description (Fossitt 2000)	Corresponding habitat in Figure 3 above	Biodiversity value in the local area
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
WL1 Hedgerows	Hedgerows	High
WL2 Treelines	Rows of planted ornamental trees	Medium
GA2 Amenity grassland	<ul style="list-style-type: none"> <li>• Public grass areas, including Village Green areas</li> <li>• Playing pitches (places where grassland would be fertilised/improved)</li> <li>• Graveyard</li> </ul>	Low
WD2 Mixed broadleaved/conifer woodland	Woodland	High
FW1 Eroding/upland rivers	Clodiagh and Gorragh rivers	High
FW4 Drainage ditches	These are often found at the base of hedgerows	High

In an urban environment, areas of amenity grassland often provide opportunities to enhance the biodiversity value of the town. Clonaslee has many areas of open, public grassland (orange and pink areas in Figure 4) 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 amenity areas and suggestions are outlined in Appendix 1 below. In some cases as seen in the Village Green areas (coloured pale orange in Figure 4) wildflowers are already doing well (Figure 5, Figure 6). These can be encouraged 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 5: Wildflowers including Cowslip (*Primula veris*) growing on Clonaslee village green



Figure 6: Close-up view of the Cowslip

Clonaslee is also in the lucky position of being within walking distance of two areas rich with biodiversity: Brittas Woods and the new Integrated Constructed Wetland. Brittas Woods are old woodlands dating back to their time as part of the Brittas Estate. Now they are state-owned and managed by Coillte so they open for the public to enjoy. They are mainly coniferous but sections do feature many beautiful native deciduous trees and their associated flora and fauna – the bluebells were just beginning to appear during our visit in April. The Woods also feature the lovely Brittas Lake with its lakeside walk (Figure 7) adding to the habitat diversity in the general Clonaslee area.



Figure 7: Brittas Woods with the Lake edge walk and its Mallard ducks.

A new Integrated Constructed Wetland is located to the north of Clonaslee on the Tullamore road. This water treatment centre is harnessing the power of nature to clean Clonaslee's wastewater and it is a pioneering project in Co. Laois. The wetland has been planted with many beautiful wetland plants such as Reedmace, Bulrush, Flag iris and Reed canary grass and is already attracting many different bird species. It is hoped the wetland will be open for the general public to enjoy its pathways and associated biodiversity in the near future.

In addition to Clonaslee village being next door to the Slieve Bloom Mountains SPA it is also sandwiched between three Special Areas of Conservation (SACs). Just a few kilometres to the west lies Clonaslee Esker & Derries Bog (SAC no. 859), surrounding the town to the south is the Slieve Bloom Mountains SAC, while a couple of kilometres to the east the River Barrow flows down from its source in the Slieve Bloom Mountains and it is an integral part of the River Barrow & River Nore SAC (no. 2162). All three of these sites are protected under the E. U. Habitats Directive, which recognises their biodiversity value as being of European-wide importance. Clonaslee is in a unique position nestled in amongst several jewels of Irish biodiversity. This brings responsibilities to mind and look after the local environment to ensure that this biodiversity wealth is carried on for future generations.

Full details of all the internationally important sites near Clonaslee are in Appendices 10 – 13.

## 5. Actions for Biodiversity

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

Table 2: Proposed Actions to improve and maintain biodiversity in the Clonaslee area

Number	Action	Location for Action	Locations (see map Figure 8)
1	Erect bird boxes	In public spaces where there are trees; in private gardens where the landowner is in agreement. Around both school grounds. Around the Heritage Centre.	<b>A:</b> Graveyard, <b>B:</b> Community Centre, Community School & Playground, <b>C:</b> Hillside View, <b>D:</b> Slieve Bloom Park, <b>F:</b> Heritage Centre, <b>H:</b> Village Green areas,
2	Erect bat boxes	In public spaces where there are trees; in private gardens where the landowner is in agreement. Around both school grounds.	<b>B:</b> Community Centre, Community School & Playground,
3	Bird feeders	Install bird feeders where people can watch from a distance e.g. outside classroom windows; in the graveyard, Heritage Centre grounds; near benches along the Clodiagh and public spaces where they can be seen from benches.	<b>A:</b> Graveyard, <b>B:</b> Community Centre, Community School & Playground, <b>C:</b> Hillside View, <b>F:</b> Heritage Centre, <b>G:</b> River Clodiagh banks, <b>H:</b> Village Green areas
4	Construct Bug Hotels	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 9).	<b>B:</b> Community Centre, Community School & Playground, <b>F:</b> Heritage Centre, <b>H:</b> Village Green areas
5	Plant biodiversity enhancing flowerbeds & pots	In the Tidy Towns tended flowerbeds and pots throughout Clonaslee.	<b>A:</b> Graveyard, <b>E:</b> Main Street, <b>F:</b> Heritage Centre, <b>H:</b> Village Green areas, <b>I:</b> Playing fields,
6	Plant wildflower meadow	Parts of the grassy areas around the Community Centre are ideal – a start has already been made. Also some areas of the graveyard – particularly with a wildflower & bulb meadow. See Appendices 4 & 5 for further details.	<b>A:</b> Graveyard, <b>B:</b> Community Centre, Community School & Playground, <b>D:</b> Slieve Bloom Park, <b>I:</b> Playing fields,

Number	Action	Location for Action	Locations (see map Figure 8)
7	Plant native trees & shrubs	Public green areas. Any open grass areas where trees would not impair drivers' sight lines.	<b>B:</b> Community Centre, Community School & Playground, <b>C:</b> Hillside View, <b>E:</b> Main Street, <b>G:</b> River Clodiagh banks, <b>H:</b> Village Green areas, <b>I:</b> Playing fields,
8	Gather & sow local, native seed	All the local hedgerows and woods.	
9	Organise a local Biodiversity Day	Clonaslee, perhaps Brittas Lake	
10	Plant a Community Orchard	The open, grassy area at the entrance to Slieve Bloom Park.	<b>D:</b> Slieve Bloom Park,
11	Change the grass-mowing regime	Any of the areas of open grassland around the town. In particular cowslips were recorded already growing in the village green areas (pale orange on the Habitat map).	<b>H:</b> Village Green areas,
12	Reduce chemical use and use natural methods of pest & weed control	Identify areas where herbicide use can be avoided, reduce chemical use everywhere if at all possible!	
13	Leave piles of leaves in quiet corners	At the back of flowerbeds or at the base of a hedge where there won't be any disturbance over the winter.	<b>B:</b> Community Centre, Community School & Playground, <b>C:</b> Hillside View, <b>F:</b> Heritage Centre,
14	Biodiversity-friendly hedgerow maintenance	Everywhere if at all possible!	
15	Biodiversity data gathering	Anywhere in the Clonaslee area especially places with most diverse habitats e.g. the woodlands and hedgerows. Private gardens are also great.	
16	Monitor local area for invasive species & control where necessary	Anywhere in the Clonaslee area.	



Figure 8: Aerial view of Clonaslee showing locations of interest (see Table 3: Location key to map in Figure 8. below for location key).

Table 3: Location key to map in Figure 8.

Location letter	Name/Description of location
A	Graveyard
B	Community Centre, Community School & Playground
C	Hillside View
D	Slieve Bloom Park
E	Main Street
F	Heritage Centre
G	River Clodiagh banks
H	Village Green areas
I	Playing fields

## **6. Progress Review**

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

## Appendix 1: Details of biodiversity actions in Clonaslee

Action	Reason	Location(s)	Timeframe	Method
Erect bird boxes	Maintain & increase bird species in the local area. Create public awareness.	In public spaces where there are trees; in private gardens where the landowner is in agreement. Around both school grounds. Around the Heritage Centre.	Years 1-5	See Appendix 2 and the accompanying information pack for advice on nestboxes for bird species.
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. Around both school grounds.	Years 1-5	See Appendix 2 and accompanying information. Why not launch the bat boxes with a community 'bat walk'? Contact Bat Conservation Ireland for ideas ( <a href="http://www.batconservationireland.org">www.batconservationireland.org</a> ).
Bird feeders	Help increase bird numbers. Create public awareness.	Install bird feeders where people can watch from a distance e.g. outside classroom windows; in the graveyard, Heritage Centre grounds; near benches along the Clodiagh and public spaces where they can be seen from benches.	Years 1-5	Free if voluntary labour and recycled materials are used. See <a href="http://www.rspb.org.uk">www.rspb.org.uk</a> and <a href="http://www.birdwatchireland.ie">www.birdwatchireland.ie</a> for designs. Ongoing maintenance through cleaning and re-stocking the feeders is very important.

Action	Reason	Location(s)	Timeframe	Method
Construct 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.	An ideal project for school children to be involved with. Any spot where the public can see them and learn of their importance e.g. the playground near the butterfly flowerbed. Where possible, a small information sign highlighting the purpose and some of the occupants of the bug hotel would be helpful (See example, Figure 2Figure 9)	Years 1-5	Free – recycle materials and ask some volunteers to construct. A great project for children as they can use their imagination (see Figure 9 for examples).
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.	Any of the flowerbeds around Clonaslee.	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.

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>Parts of the grassy areas around the Community Centre are ideal – a start has already been made. Also some areas of the graveyard – particularly with a wildflower &amp; bulb meadow. See Appendices 4 &amp; 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 <b>wildflower meadow</b> 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><b>Bulb meadows</b> are a variation of the wildflower meadow (Figure 10). 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>
Plant native trees & shrubs	<p>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!).</p>	<ul style="list-style-type: none"> <li>• Public green areas.</li> <li>• Any open grass areas where trees would not impair drivers' sight lines.</li> </ul>	<p>Once-off action within the 5 year timeframe.</p>	<p>Free if next action is followed!</p> <p>Groups of trees (even 3-5 in small areas) are preferable to single trees. Do not use herbicides, use tree tubes as an alternative</p> <p>See Appendix 3 below for species suggestions particularly noting the Irish Whitebeam. This beautiful small tree (&lt;6m) is a relation of the Rowan and it also features beautiful creamy flowers and red berries providing interest through the seasons. Also the green leaves have white undersides. The nearby Slieve Blooms are a stronghold of this uncommon species.</p>

Action	Reason	Location(s)	Timeframe	Method
Gather & sow local, native seed	Ensuring the plants are indigenous species from native stock ensures both biodiversity value and control of plant disease spread.	Any of the local hedgerows.	Years 1-5	Free if compost & pots are donated – old paper-based milk cartons work well.  A good project to involve local school pupils.
Organise a local Biodiversity Day	To increase local awareness of the importance of biodiversity. This can also result in recruitment of more local volunteers	Both the nearby Brittas Woods and the Integrated Constructed Wetland would make great spots for holding biodiversity-themed events.	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 ( <a href="http://www.biodiversityireland.ie">www.biodiversityireland.ie</a> ).  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.
Plant a Community Orchard	Aesthetically pleasing while also providing fruit for community use e.g. a local Apple Day. Orchards are habitats of high biodiversity value.	The open, grassy area at the entrance to Slieve Bloom Park.	Once-off action within the 5 year timeframe.	Irish Seed Savers Association ( <a href="http://www.irishseedsavers.ie">www.irishseedsavers.ie</a> ) stock and sell varieties of apple trees indigenous to the area. These will grow best in local conditions. Often there are old variety apple trees growing in local gardens of old houses. There is a beautiful, mature apple tree in the grounds of the old VEC. With the owners' permission and some horticultural expertise it would be possible to propagate these trees.

Action	Reason	Location(s)	Timeframe	Method
<p>Change the grass-mowing regime by:</p> <p>(a) delaying the annual first cut to early May;</p> <p>(b) only mowing half the width of the roadside verges</p>	<p>This encourages biodiversity by allowing wildflowers such as Cow parsley &amp; Cowslip to flower and set seed for more flowers next year. This will also benefit pollinators such as bumble bees and honey bees, by providing a food source</p>	<p>Any of the areas of open grassland around the town. In particular cowslips were recorded already growing in the village green areas (pale orange on the Habitat map).</p>	<p>Every year</p>	<p>No extra cost. Just delaying the first cut of the year by even 2 weeks can help wildflowers to set seed or as is often seen mowing <i>around</i> Cowslips and leaving them uncut results in more flowers in subsequent years. A small sign saying 'Left unmown for wildlife' will allay any misunderstandings about untidiness! (see Figure 1 for a good example)</p>
<p>Reduce herbicide use and choose natural methods of pest &amp; weed control</p>	<p>Pesticides and herbicides decrease biodiversity and leave residual chemicals in the soil which continue to reduce biodiversity into the future.</p> <p>Pesticides and herbicides can be lethal for predators (e.g. Barn Owls) that ingest large doses through their prey (rats &amp; mice), as well as damaging pollinators both directly and indirectly by removing their food sources.</p>	<p>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.</p>	<p>Every year</p>	<p>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.</p>

Action	Reason	Location(s)	Timeframe	Method
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
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.	Every year	See Appendix 4 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 Clonaslee area especially places with most diverse habitats e.g. the woodlands and hedgerows. 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 <a href="http://www.birdwatchireland.ie">www.birdwatchireland.ie</a> ).  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 <a href="http://www.biodiversityireland.ie">www.biodiversityireland.ie</a> ).  The National Parks & Wildlife Service welcome records too (see <a href="http://www.npws.ie">www.npws.ie</a> ).

Action	Reason	Location(s)	Timeframe	Method
Monitor local area for invasive species	Damaging invasive species are an increasing problem for Ireland's native biodiversity	Anywhere in the Clonaslee area.	Every year. Anyone with an interest.	See Appendix 6 and <a href="http://www.biodiversityireland.ie">www.biodiversityireland.ie</a> for further details.



Figure 9. Examples of 'Bug Hotels' re-using various materials

Pictures include an example of an important information notice written by pupils of Holy Trinity School Donaghmede, Co. Dublin



Figure 10. A bulb meadow at Tullynally Gardens, Co. Westmeath



Figure 11. Orchard with wildflower meadow and mown grass path beneath at Butler House, Kilkenny.

## 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](http://www.birdwatchireland.ie)) and the British bird charity the RSBP ([www.rsbp.org.uk](http://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. A 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](http://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 is also provides a suitable space for bats to feed when weather conditions are poor.



Figure 12. Bat box on the east wall of St. Patrick's Hall, Ballacolla, Co. Laois



Figure 13. 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](http://www.galway.ie/biodiversityguidelines)) and guidelines of The Hedge Laying Association of Ireland (see: [www.hedgelaying.ie](http://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](http://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 Clonaslee 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](http://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.
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## Appendix 8. Helpful Contacts, Organisations & Websites

Laois Tidy Towns Facilitator and Environment Awareness Officer: Ann-Marie Kelly, T (057) 867 4331 E [amkelly@laoiscoco.ie](mailto:amkelly@laoiscoco.ie)

Laois County Council Heritage Officer: Catherine Casey, T (057) 866 4129 E [ccasey@laoiscoco.ie](mailto:ccasey@laoiscoco.ie)

National Parks & Wildlife Service District Conservation Officer for Laois: tel. 076 1002590

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

1. Humans are an integral part of the Biodiversity of Earth and our actions can influence it in both a positive and negative way.
2. 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

## Appendix 10. Slieve Bloom Mountains Special Protection Area

The following text is a description of the Slieve Bloom Mountains SPA which is very close to the village of Clonaslee. It gives an idea of the biodiversity value and importance of the river the area in which the village is situated, and the special responsibilities of those living in and around Clonaslee to protect the biodiversity of their area. Further information about SACs and their management implications can be obtained from the National Parks & Wildlife Service local office (tel. 076 100 2590) or [www.npws.ie](http://www.npws.ie)

The Slieve Bloom Mountains SPA is situated on the border between Counties Offaly and Laois, and runs along a north-east/south-west aligned ridge for approximately 25km. Much of the site is over 200m in altitude, rising to a maximum height of 527m at Arderin. The mountains are of Old Red Sandstone, flanked by Silurian rocks. Several important rivers rise within the site, including the Barrow, Delour and Silver.

The site has a near continuous ridge of mountain blanket bog, with wet and dry heaths also well represented. Species present in these habitats include Ling Heather (*Calluna vulgaris*), Crowberry (*Empetrum nigrum*), Bilberry (*Vaccinium myrtillus*), Cottongrasses (*Eriophorum* spp.), Deergrass (*Scirpus cespitosus*) and Bog Asphodel (*Narthecium ossifragum*). Much of the slopes are afforested, and overall coniferous plantations account for c. 60% of the site. The forests include first and second rotation plantations, with both pre-thicket and post-thicket stands present. Substantial areas of clear-fell are also present at any one time. The principal tree species present are Sitka Spruce (*Picea sitchensis*) and Lodgepole Pine (*Pinus contorta*). The remainder of the site is mostly rough grassland that is used for hill farming. This varies in composition and includes some wet areas with rushes (*Juncus* spp.) and some areas subject to scrub encroachment. Some stands of deciduous woodland also occur, especially within the river valleys.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for Hen Harrier. This SPA is one of the strongholds for Hen Harrier in the country and, indeed, is the most easterly regular population. A survey in 2005 resulted in five confirmed and three possible breeding pairs, whereas ten confirmed pairs and one possible pair had been recorded in the 1998-2000 period. These numbers represent c. 5% of the national total. The mix of forestry and open areas provides optimum habitat conditions for this rare bird, which is listed on Annex I of the E.U. Birds Directive. The early stages of new and second-rotation conifer plantations are the most frequently used nesting sites, though some pairs may still nest in tall heather of unplanted bogs and heath. Hen Harriers will forage up to circa 5km from the nest site, utilising open bog and moorland, young conifer plantations and hill farmland that is not too rank. Birds will often forage in openings and gaps within forests. In Ireland, small birds and small mammals appear to be the most frequently taken prey.

The site is also a traditional site for a breeding pair of Peregrine. Several pairs of Merlin are known to breed within the site but further survey is required to determine the exact status of this small falcon. Both of these species are also listed on Annex I of the E.U. Birds Directive. Red Grouse is found on many of the unplanted areas of bog and heath – this is a species that has declined in Ireland and is now Red-listed.

The main threat to the long-term survival of Hen Harriers within the site is further afforestation, which would reduce and fragment the area of foraging habitat, resulting in possible reductions in breeding density and productivity. The observed decline between the 1998-2000 and 2005 surveys may be real and due to habitat change as a result of maturation of conifer plantations. Much of the unplanted blanket bog is a Statutory Nature Reserve.

Overall, the site provides excellent nesting and foraging habitat for breeding Hen Harrier and is among the top five sites in the country for the species. It is also likely to be of national importance for breeding Merlin.

## Appendix 11. Slieve Bloom Mountains Special Area for Conservation

The following is a scientific description of the Slieve Blooms SAC which covers much of the high area of the Slieve Bloom Mountains to the south of Clonaslee. Further information about SACs and their management implications can be obtained from the National Parks & Wildlife Service local office (tel. 076 1002590) or [www.npws.ie](http://www.npws.ie).

The Slieve Bloom Mountains lie on the Offaly-Laois border, starting about 8 km north-east of Roscrea and running about 24 km north-east, towards Clonaslee. The mountains are of Old Red Sandstone, flanked by Silurian rocks. The site extends from approximately 180 m to 529 m O.D. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (\* = priority; numbers in brackets are Natura 2000 codes):

[4010] Wet Heath

[7130] Blanket Bogs (Active)\*

[91E0] Alluvial Forests\*

This site is remarkable for its mountain blanket bog habitat. Generally uniform in character, the vegetation consists of a deep, spongy mat of the bog moss *Sphagnum capillifolium*, with other mosses and lichens. Growing on this are Heather (*Calluna vulgaris*) and Crowberry (*Empetrum nigrum*), with smaller amounts of Cottongrasses (*Eriophorum* spp.), Bilberry (*Vaccinium myrtillus*), Deergrass (*Scirpus cespitosus*) and Bog Asphodel (*Narthecium ossifragum*). An unusual feature is the abundance of Bog rosemary (*Andromeda polifolia*) and Cranberry (*Vaccinium oxycoccos*), species usually associated with raised bogs. The uncommon Lesser Twayblade (*Listera cordata*) occurs under Heather at this site.

This extensive site is dominated by blanket bog on a high plateau. However, on more steeply-sloping flanks wet heath vegetation occurs on shallower peat (typically 0.5- 1.5 m deep). The dominant species in the wet heath are Heather and Purple Moorgrass (*Molinia caerulea*), with species such as Cross-leaved Heath (*Erica tetralix*), Tormentil (*Potentilla erecta*), Lousewort (*Pedicularis sylvatica*) and the bog moss *S. capillifolium* also being frequent components. Often wet heath vegetation is associated with flushed areas along the margins of narrow streams. Alluvial forest occurs along the Camcor River in the northern part of the site, on the floodplain of the river and on adjacent slopes along the valley. The canopy consists of scattered tall Ash (*Fraxinus excelsior*), Pedunculate Oak (*Quercus robur*) and Alder (*Alnus glutinosa*). Rusty Willow (*Salix cinerea* subsp. *oleifolia*), Hawthorn (*Crataegus monogyna*), Hazel (*Corylus avellana*) and Downy Birch (*Betula pubescens*) form a lower canopy.

The ground flora is species-rich, with Bluebell (*Hyacinthoides non-scripta*), Enchanter's-nightshade (*Circaea lutetiana*), Wood-sorrel (*Oxalis acetosella*) and Bugle (*Ajuga reptans*). Marsh-marigold (*Caltha palustris*) and Meadowsweet (*Filipendula* Version date: 22.08.2013 2 of 2 000412\_Rev13.Doc *ulmaria*) typify the wetter areas. The natural flood regime at the site has been altered by drainage activities for forestry (embankments, etc.), though the least disturbed areas in the floodplain still

retain a substantial wetness. Seepage areas on the slopes also contribute to the wetness of the woods. The uplands at this site provide excellent habitat for Peregrine, a species listed on Annex I of the E.U. Birds Directive. Breeding pairs occur here.

For the main part, the site is fringed by forestry plantations, although in a few places there remains a relatively undisturbed transition downslope to poorly-drained acidic grassland. The primary threats to Irish blanket bogs in general are afforestation, drainage and over-grazing, and current habitat quality is often dependent on past land use. On the Slieve Blooms, the Heather forms tall, dense stands, with individual stems up to 20 years old, suggesting that burning has not been extensive in recent years. There is little evidence of grazing or erosion. Overall, vegetation structure is exceptionally well-conserved due to lack of disturbance.

A large portion of the site lies within a Statutory Nature Reserve. Blanket bogs are an increasingly rare habitat in Europe, and in Ireland are continually under threat. The Slieve Bloom Mountains are an important link in the east-to-west gradient of bogs in Ireland, and are floristically linked to the midland raised bogs north of the site. The intactness of the blanket bog here is remarkable and is echoed in few other areas in Ireland, making this site of unique conservation value. Also of conservation importance is the presence of wet heath and an example of alluvial forest.

## Appendix 12. Clonaslee Eskers and Derry Bog Special Area for Conservation

The following is a scientific description of the Clonaslee Eskers and Derry Bog SAC which is within a few kilometres of the edge of Clonaslee village. Further information about SACs and their management implications can be obtained from the National Parks & Wildlife Service local office (tel. 076 1002590) or [www.npws.ie](http://www.npws.ie).

Located approximately 5 km west of the town of Clonaslee, and largely in Co. Laois, this site consists of a series of morainic hills and esker ridges which are the legacy of the last period of glaciation. To the north-west, the Derry Hills are two isolated hills situated in a bog, which forms part of the site. The main esker ridge runs along the southern part of the site.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (\* = priority; numbers in brackets are Natura 2000 codes): [7230] Alkaline Fens [1013] Geyer's Whorl Snail (*Vertigo geyeri*) An unusual assemblage of plants is found on the western part of the esker and on the Derry Hills. Calcicole species such as Mountain Everlasting (*Antennaria dioica*), Yellow-wort (*Blackstonia perfoliata*), Autumn Gentian (*Gentianella amarella*) and Carline Thistle (*Carlina vulgaris*) grow with species more typical of acid heaths. These include Tormentil (*Potentilla erecta*), Fragrant Orchid (*Gymnadenia conopsea*), Goldenrod (*Solidago virgaurea*) and Heather (*Calluna vulgaris*). Wood Vetch (*Vicia sylvatica*) and Bitter-vetch (*Lathyrus montanus*) occur in limestone heath on the Derry Hills. These species are very restricted in their distribution in Ireland. Blue Moorgrass (*Sesleria albicans*) has also been recorded, a rare occurrence of this species in a location east of the River Shannon. Small disused gravel pits occur within the site, which are vegetated by species such as Field Madder (*Sherardia arvensis*), Common Whitlowgrass (*Erophila verna*) and Thyme-leaved Sandwort (*Arenaria serpyllifolia*)

Both the southern esker and the Derry Hills support patches of woodland. In some areas, an open canopy of Sessile Oak (*Quercus petraea*) and Silver Birch (*Betula pendula*) occurs. Beneath this, the ground flora includes Wood Anemone (*Anemone nemorosa*), Wood Sage (*Teucrium scorodonia*) and Bilberry (*Vaccinium myrtillus*). In the south-western part of the site, woodland dominated by Hazel (*Corylus avellana*) is more common. Ash (*Fraxinus excelsior*), Hawthorn (*Crataegus monogyna*) and Sycamore (*Acer pseudoplatanus*) also occur, with Sessile Oak and Downy Birch. To the east of the road water percolates down through the glacial material of the esker ridge and emerges in a series of small, calcium-rich springs which flow into cut-away bog to the north. This has resulted in the creation of a species-rich alkaline fen. Black Bog-rush (*Schoenus nigricans*) dominates the vegetation here.

Also present are Pale Butterwort (*Pinguicula lusitanica*), Meadow Thistle (*Cirsium dissectum*), Round-leaved Sundew (*Drosera rotundifolia*) and the distinctive Fly Orchid (*Ophrys insectifera*). The latter species is confined to parts of the west and midlands of Ireland, where it occurs only occasionally. Derry Bog, which is a cut-away raised bog, lies to the north-west of the site. This supports a typical range of bog mosses (*Sphagnum* spp.) and flowering plants, such as Heather and Bog Asphodel (*Narthecium ossifragum*). The rare whorl snail *Vertigo geyeri* was recorded from the fen area at this site in 1998. This species is a glacial relic with a disjunct European population, which is considered

vulnerable due to loss of habitat, particularly through drainage. Two plant species protected under the Flora (Protection) Order, 1999, occur within the site. Wood Bitter-vetch (*Vicia orobus*) occurs in quantity among oak/birch scrub on the Derry Hills. This species has declined due to land reclamation and has only been seen at one other location since 1970. Basil Thyme (*Acinos arvensis*) occurs in a disused gravel pit and has been seen at only three other sites since 1970.

This species favours open gravel and has declined due to the agricultural use of herbicides. Blue Fleabane (*Erigeron acer*) had been recorded with Basil Thyme at this site. This species is rare and threatened in Ireland, and is listed in the Red Data Book as a species confined mostly to open gravel habitats in central and south-eastern Ireland.

A significant land use practice within the site is the extraction of gravel. One quarry west of the road is currently being worked. This activity leads directly to destruction of the esker and irreparable damage to the site. Some of the esker grasslands (mostly at the western end) have been improved either for pasture or for arable farming. This site is of conservation importance for the presence of alkaline fen vegetation and is considered one of the best sites in the south-east region for this habitat. Also of interest is the extremely unusual assemblage of plants associated with the esker ridges, which includes three rare plants, two of which are legally protected in Ireland. Of further conservation importance is the presence of the rare snail *Vertigo geyeri*.

## Appendix 13. River Barrow and River Nore Special Area for Conservation

The following is a scientific description of the River Barrow and River Nore SAC which runs within a kilometre of the edge of Clonaslee village. Further information about SACs and their management implications can be obtained from the National Parks & Wildlife Service local office (tel. 076 1002590) or [www.npws.ie](http://www.npws.ie).

This site consists of the freshwater stretches of the Barrow and Nore River catchments as far upstream as the Slieve Bloom Mountains, and it also includes the tidal elements and estuary as far downstream as Creadun Head in Waterford. The site passes through eight counties – Offaly, Kildare, Laois, Carlow, Kilkenny, Tipperary, Wexford and Waterford. Major towns along the edge of the site include Mountmellick, Portarlinton, Monasterevin, Stradbally, Athy, Carlow, Leighlinbridge, Graiguenamanagh, New Ross, Inistioge, Thomastown, Callan, Bennettsbridge, Kilkenny and Durrow. The larger of the many tributaries include the Lerr, Fushoge, Mountain, Aughavaud, Owenass, Boherbaun and Stradbally Rivers of the Barrow, and the Delour, Dinin, Erkina, Owveg, Munster, Arrigle and King's Rivers on the Nore.

Both rivers rise in the Old Red Sandstone of the Slieve Bloom Mountains before passing through a band of Carboniferous shales and sandstones. The Nore, for a large part of its course, traverses limestone plains and then Old Red Sandstone for a short stretch below Thomastown. Before joining the Barrow it runs over intrusive rocks poor in silica. The upper reaches of the Barrow also run through limestone. The middle reaches and many of the eastern tributaries, sourced in the Blackstairs Mountains, run through Leinster Granite. The southern end, like the Nore runs over intrusive rocks poor in silica. Waterford Harbour is a deep valley excavated by glacial floodwaters when the sea level was lower than today. The coast shelves quite rapidly along much of the shore.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (\* = priority; numbers in brackets are Natura 2000 codes):

- [1130] Estuaries
- [1140] Tidal Mudflats and Sandflats
- [1310] *Salicornia* Mud
- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [3260] Floating River Vegetation
- [4030] Dry Heath
- [6430] Hydrophilous Tall Herb Communities
- [7220] Petrifying Springs\*
- [91A0] Old Oak Woodlands
- [91E0] Alluvial Forests\*
- [1016] Desmoulin's Whorl Snail (*Vertigo moulinsiana*)
- [1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*)
- [1092] White-clawed Crayfish (*Austropotamobius pallipes*)
- [1095] Sea Lamprey (*Petromyzon marinus*)

- [1096] Brook Lamprey (*Lampetra planeri*)
- [1099] River Lamprey (*Lampetra fluviatilis*)
- [1103] Twaite Shad (*Alosa fallax*)
- [1106] Atlantic Salmon (*Salmo salar*)
- [1355] Otter (*Lutra lutra*)
- [1421] Killarney Fern (*Trichomanes speciosum*)
- [1990] Nore Freshwater Pearl Mussel (*Margaritifera durrovensis*)

Good examples of alluvial forest (a priority habitat on Annex I of the E.U. Habitats Directive) are seen at Rathsnagadan, Murphy's of the River, in Abbeyleix estate and along other shorter stretches of both the tidal and freshwater elements of the site. Typical species seen include Almond Willow (*Salix triandra*), White Willow (*S. alba*), Rusty Willow (*S. cinerea* subsp. *oleifolia*), Crack Willow (*S. fragilis*) and Osier (*S. viminalis*), along with Iris (*Iris pseudacorus*), Hemlock Water-dropwort (*Oenanthe crocata*), Wild Angelica (*Angelica sylvestris*), Thin-spiked Wood-sedge (*Carex strigosa*), Pendulous Sedge (*C. pendula*), Meadowsweet (*Filipendula ulmaria*), Common Valerian (*Valeriana officinalis*) and the Red Data Book species Nettle-leaved Bellflower (*Campanula trachelium*).

A good example of petrifying springs with tufa formations occurs at Dysart Wood along the Nore. This is a rare habitat in Ireland and one listed with priority status on Annex I of the E.U. Habitats Directive. These hard water springs are characterised by lime encrustations, often associated with small waterfalls. A rich bryophyte flora is typical of the habitat and two diagnostic species, *Cratoneuron commutatum* var. *commutatum* and *Eucladium verticillatum*, have been recorded.

The best examples of old oak woodlands are seen in the ancient Park Hill woodland in the estate at Abbeyleix; at Kyleadohir, on the Delour, Forest Wood House, Kylecorragh and Brownstown Woods on the Nore; and at Cloghristic Wood, Drummond Wood and Borris Demesne on the Barrow, though other patches occur throughout the site. Abbeyleix Woods is a large tract of mixed deciduous woodland which is one of the only remaining true ancient woodlands in Ireland. Historical records show that Park Hill has been continuously wooded since the 16<sup>th</sup> century and has the most complete written record of any woodland in the country. It supports a variety of woodland habitats and an exceptional diversity of species including 22 native trees, 44 bryophytes and 92 lichens. It also contains eight indicator species of ancient woodlands. Park Hill is also the site of two rare plants, Nettle-leaved Bellflower and the moss *Leucodon sciuroides*. The rare Myxomycete fungus, *Licea minima* has been recorded from woodland at Abbeyleix.

Oak woodland covers parts of the valley side south of Woodstock and is well developed at Brownsford where the Nore takes several sharp bends. The steep valley side is covered by oak (*Quercus* spp.), Holly (*Ilex aquifolium*), Hazel (*Corylus avellana*) and Downy Birch (*Betula pubescens*), with some Beech (*Fagus sylvatica*) and Ash (*Fraxinus excelsior*). All the trees are regenerating through a cover of Bramble (*Rubus fruticosus* agg.), Foxglove (*Digitalis purpurea*), Great Wood-rush (*Luzula sylvatica*) and Broad Buckler-fern (*Dryopteris dilatata*).

On the steeply sloping banks of the River Nore, about 5 km west of New Ross, in Co. Kilkenny, Kylecorragh Woods form a prominent feature in the landscape. This is an excellent example of a relatively undisturbed, relict oak woodland with a very good tree canopy. The wood is quite damp and there is a rich and varied ground flora. At Brownstown a small, mature oak dominated woodland occurs on a steep slope. There is younger woodland to the north and east of it. Regeneration

throughout is evident. The understorey is similar to the woods at Brownsford. The ground flora of this woodland is developed on acidic, brown earth type soil and comprises a thick carpet of Bilberry (*Vaccinium myrtillus*), Heather (*Calluna vulgaris*), Hard Fern (*Blechnum spicant*), Common Cow-wheat (*Melampyrum pratense*) and Bracken (*Pteridium aquilinum*).

Borris Demesne contains a very good example of a semi-natural broadleaved woodland in very good condition. There is quite a high degree of natural re-generation of oak and Ash through the woodland. At the northern end of the estate oak species predominate. Drummond Wood, also on the Barrow, consists of three blocks of deciduous woods situated on steep slopes above the river. The deciduous trees are mostly oak species. The woods have a well established understorey of Holly, and the herb layer is varied, with Bramble abundant. The whitebeam *Sorbus devoniensis* has also been recorded here.

Eutrophic tall herb vegetation occurs in association with the various areas of alluvial forest and elsewhere where the floodplain of the river is intact. Characteristic species of the habitat include Meadowsweet, Purple Loosestrife (*Lythrum salicaria*), Marsh Ragwort (*Senecio aquaticus*), Ground Ivy (*Glechoma hederacea*) and Hedge Bindweed (*Calystegia sepium*). Indian Balsam (*Impatiens glandulifera*), an introduced and invasive species, is abundant in places.

Floating river vegetation is well represented in the Barrow and in the many tributaries of the site. In the Barrow the species found include water-starworts (*Callitriche* spp.), Canadian Pondweed (*Elodea canadensis*), Bulbous Rush (*Juncus bulbosus*), water-milfoils (*Myriophyllum* spp.), the pondweed *Potamogeton x nitens*, Broad-leaved Pondweed (*P. natans*), Fennel Pondweed (*P. pectinatus*), Perfoliated Pondweed (*P. perfoliatus*) and crowfoots (*Ranunculus* spp.). The water quality of the Barrow has improved since the vegetation survey was carried out (EPA, 1996).

Dry heath at the site occurs in pockets along the steep valley sides of the rivers especially in the Barrow Valley and along the Barrow tributaries where they occur in the foothills of the Blackstairs Mountains. The dry heath vegetation along the slopes of the river bank consists of Bracken and Gorse (*Ulex europaeus*) with patches of acidic grassland vegetation. Additional typical species include Heath Bedstraw (*Galium saxatile*), Foxglove, Common Sorrel (*Rumex acetosa*) and Creeping Bent (*Agrostis stolonifera*). On the steep slopes above New Ross the Red Data Book species Greater Broomrape (*Orobanche rapum-genistae*) has been recorded. Where rocky outcrops are shown on the maps Bilberry and Great Wood-rush are present. At Ballyhack a small area of dry heath is interspersed with patches of lowland dry grassland. These support a number of clover species, including the legally protected Clustered Clover (*Trifolium glomeratum*) - a species known from only one other site in Ireland. This grassland community is especially well developed on the west side of the mud-capped walls by the road. On the east of the cliffs a group of rock-dwelling species occur, i.e. English Stonecrop (*Sedum anglicum*), Sheep's-bit (*Jasione montana*) and Wild Madder (*Rubia peregrina*). These rocks also support good lichen and moss assemblages with *Ramalina subfarinacea* and *Hedwigia ciliata*.

Dry heath at the site generally grades into wet woodland or wet swamp vegetation lower down the slopes on the river bank. Close to the Blackstairs Mountains, in the foothills associated with the Aughnabriskey, Aughavau and Mountain Rivers there are small patches of wet heath dominated by Purple Moor-grass (*Molinia caerulea*) with Heather, Tormentil (*Potentilla erecta*), Carnation Sedge (*Carex panicea*) and Bell Heather (*Erica cinerea*).

Salt meadows occur at the southern section of the site in old meadows where the embankment has been breached, along the tidal stretches of in-flowing rivers below Stokestown House, in a narrow band on the channel side of Common Reed (*Phragmites australis*) beds and in narrow fragmented strips along the open shoreline. In the larger areas of salt meadow, notably at Carrickcloney, Ballinlaw Ferry and Rochestown on the west bank; Fisherstown, Alderton and Great Island to Dunbrody on the east bank, the Atlantic and Mediterranean sub types are generally intermixed. At the upper edge of the salt meadow in the narrow ecotonal areas bordering the grasslands where there is significant percolation of salt water, the legally protected species Borrer's Saltmarsh-grass (*Puccinellia fasciculata*) and Meadow Barley (*Hordeum secalinum*) are found. The very rare and also legally protected Divided Sedge (*Carex divisa*) is also found. Sea Rush (*Juncus maritimus*) is also present. Other plants recorded and associated with salt meadows include Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Sea Couch (*Elymus pycnanthus*), Spear-leaved Orache (*Atriplex prostrata*), Lesser Sea-spurrey (*Spergularia marina*), Sea Arrowgrass (*Triglochin maritima*) and Sea Plantain (*Plantago maritima*).

Glassworts (*Salicornia* spp.) and other annuals colonising mud and sand are found in the creeks of the saltmarshes and at the seaward edges of them. The habitat also occurs in small amounts on some stretches of the shore free of stones.

The estuary and the other E.U. Habitats Directive Annex I habitats within it form a large component of the site. Extensive areas of intertidal flats, comprised of substrates ranging from fine, silty mud to coarse sand with pebbles/stones are present. Good quality intertidal sand and mudflats have developed on a linear shelf on the western side of Waterford Harbour, extending for over 6 km from north to south between Passage East and Creadaun Head, and in places are over 1 km wide. The sediments are mostly firm sands, though grade into muddy sands towards the upper shore. They have a typical macro-invertebrate fauna, characterised by polychaetes and bivalves. Common species include *Arenicola marina*, *Nephtys hombergii*, *Scoloplos armiger*, *Lanice conchilega* and *Cerastoderma edule*.

The western shore of the harbour is generally stony and backed by low cliffs of glacial drift. At Woodstown there is a sandy beach, now much influenced by recreation pressure and erosion. Behind it a lagoonal marsh has been impounded which runs westwards from Gaultiere Lodge along the course of a slow stream. An extensive reedbed occurs here. At the edges is a tall fen dominated by sedges (*Carex* spp.), Meadowsweet, willowherbs (*Epilobium* spp.) and rushes (*Juncus* spp.). Wet woodland also occurs.

The dunes which fringe the strand at Duncannon are dominated by Marram (*Ammophila arenaria*) towards the sea. Other species present include Wild Clary/Sage (*Salvia verbenaca*), a rare Red Data Book species. The rocks around Duncannon ford have a rich flora of seaweeds typical of a moderately exposed shore and the cliffs themselves support a number of coastal species on ledges, including Thrift, Rock Samphire (*Crithmum maritimum*) and Buck's-horn Plantain (*Plantago coronopus*).

Other habitats which occur throughout the site include wet grassland, marsh, reedswamp, improved grassland, arable land, quarries, coniferous plantations, deciduous woodland, scrub and ponds.

Seventeen Red Data Book plant species have been recorded within the site, most in the recent past. These are Killarney Fern (*Trichomanes speciosum*), Divided Sedge, Clustered Clover, Basil Thyme (*Acinos arvensis*), Red Hemp-nettle (*Galeopsis angustifolia*), Borrer's Saltmarsh-grass, Meadow Barley, Opposite-leaved Pondweed (*Groenlandia densa*), Meadow Saffron/Autumn Crocus (*Colchicum autumnale*), Wild Clary/Sage, Nettle-leaved Bellflower, Saw-wort (*Serratula tinctoria*), Bird Cherry (*Prunus padus*), Blue Fleabane (*Erigeron acer*), Fly Orchid (*Ophrys insectifera*), Ivy Broomrape (*Orobanche hederæ*) and Greater Broomrape. Of these, the first nine are protected under the Flora (Protection) Order, 1999. Divided Sedge was thought to be extinct but has been found in a few locations in the site since 1990. In addition plants which do not have a very wide distribution in the country are found in the site including Thin-spiked Wood-sedge, Field Garlic (*Allium oleraceum*) and Summer Snowflake. Six rare lichens, indicators of ancient woodland, are found including *Lobaria laetevirens* and *L. pulmonaria*. The rare moss *Leucodon sciuroides* also occurs.

The site is very important for the presence of a number of E.U. Habitats Directive Annex II animal species including Freshwater Pearl Mussel (both *Margaritifera margaritifera* and *M. m. durrovensis*), White-clawed Crayfish, Salmon, Twaite Shad, three lamprey species – Sea Lamprey, Brook Lamprey and River Lamprey, the tiny whorl snail *Vertigo moulinsiana* and Otter. This is the only site in the world for the hard water form of the Freshwater Pearl Mussel, *M. m. durrovensis*, and one of only a handful of spawning grounds in the country for Twaite Shad. The freshwater stretches of the River Nore main channel is a designated salmonid river. The Barrow/Nore is mainly a grilse fishery though spring salmon fishing is good in the vicinity of Thomastown and Inistioge on the Nore. The upper stretches of the Barrow and Nore, particularly the Owenass River, are very important for spawning. The site supports many other important animal species. Those which are listed in the Irish Red Data Book include Daubenton's Bat, Badger, Irish Hare and Common Frog. The rare Red Data Book fish species Smelt (*Osmerus eperlanus*) occurs in estuarine stretches of the site. In addition to the Freshwater Pearl Mussel, the site also supports two other freshwater mussel species, *Anodonta anatina* and *A. cygnea*.

Three rare invertebrates have been recorded in alluvial woodland at Murphy's of the River. These are: *Neoascia obliqua* (Order Diptera: Syrphidae), *Tetanocera freyi* (Order Diptera: Sciomyzidae) and *Dictya umbrarum* (Order Diptera: Sciomyzidae). The rare invertebrate, *Mitostoma chrysomelas* (Order Arachnida), occurs in the old oak woodland at Abbeyleix and only two other sites in the country. Two flies (Order Diptera) *Chrysogaster virescens* and *Hybomitra muhlfeldi* also occur at this woodland.

The site is of ornithological importance for a number of E.U. Birds Directive Annex I species, including Greenland White-fronted Goose, Whooper Swan, Bewick's Swan, Bar-tailed Godwit, Peregrine and Kingfisher. Nationally important numbers of Golden Plover and Bar-tailed Godwit are found during the winter. Wintering flocks of migratory birds are seen in Shanahoe Marsh and the Curragh and Goul Marsh, both in Co. Laois, and also along the Barrow Estuary in Waterford Harbour. There is also an extensive autumnal roosting site in the reedbeds of the Barrow Estuary used by Swallows before they leave the country. The old oak woodland at Abbeyleix has a typical bird fauna including Jay, Long-eared Owl and Raven. The reedbed at Woodstown supports populations of typical waterbirds including Mallard, Snipe, Sedge Warbler and Water Rail.

Land use at the site consists mainly of agricultural activities – mostly intensive in nature and principally grazing and silage production. Slurry is spread over much of the area. Arable crops are also grown. The spreading of slurry and fertiliser poses a threat to the water quality of the salmonid river and to the populations of E.U. Habitats Directive Annex II animal species within the site. Many of the woodlands along the rivers belong to old estates and support many non-native species. Little active woodland management occurs. Fishing is a main tourist attraction along stretches of the main rivers and their tributaries and there are a number of Angler Associations, some with a number of beats. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place on the rivers. There is net fishing in the estuary and a mussel bed also. Other recreational activities such as boating, golfing and walking, particularly along the Barrow towpath, are also popular. There is a golf course on the banks of the Nore at Mount Juliet and GAA pitches on the banks at Inistioge and Thomastown. There are active and disused sand and gravel pits throughout the site. Several industrial developments, which discharge into the river, border the site. New Ross is an important shipping port. Shipping to and from Waterford and Belview ports also passes through the estuary.

The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, over-grazing within the woodland areas, and invasion by non-native species, for example Cherry Laurel (*Prunus laurocerasus*) and Rhododendron (*Rhododendron ponticum*). The water quality of the site remains vulnerable. Good quality water is necessary to maintain the populations of the Annex II animal species listed above. Good quality is dependent on controlling fertilisation of the grasslands, particularly along the Nore. It also requires that sewage be properly treated before discharge. Drainage activities in the catchment can lead to flash floods which can damage the many Annex II species present. Capital and maintenance dredging within the lower reaches of the system pose a threat to migrating fish species such as lamprey and shad. Land reclamation also poses a threat to the salt meadows and the populations of legally protected species therein.

Overall, the site is of considerable conservation significance for the occurrence of good examples of habitats and of populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive. Furthermore it is of high conservation value for the populations of bird species that use it. The occurrence of several Red Data Book plant species including three rare plants in the salt meadows and the population of the hard water form of the Freshwater Pearl Mussel, which is limited to a 10km stretch of the Nore, add further interest to this site.









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