



Local Biodiversity Action Plan

for

Mountrath, Co. Laois

by Fiona Mac Gowan B.Sc. Ph.D., Consulting Ecologist

For

Laois County Council

November 2015



An Chomhairle Oidhreachta
The Heritage Council



Contents

1. Acknowledgements	1
2. Introduction.....	2
3. Main Concepts.....	3
4. Local Context	7
5. Proposed Biodiversity Actions.....	14
6. Progress Review.....	17
Appendix 1: Details of Biodiversity actions in Mountrath.....	18
Appendix 2. Bird & bat boxes	25
Appendix 3. Recommended species for planting.....	29
Appendix 4. Hedgerow Maintenance Tips	34
Appendix 5: Management Regimes for Various Habitats	36
Appendix 6: Invasive species identification, monitoring & control.....	38
Appendix 7. Helpful Reading Material.....	39
Appendix 8. Helpful Contacts, Organisations & Websites	40
Appendix 9. Definitions & Explanations	41
Appendix 10: River Barrow and River Nore Special Area of Conservation (SAC) Site Synopsis	42

List of Figures

Figure 1: Roadside verge left uncut to benefit wildflowers and pollinators, with sign explaining the project	5
Figure 2: The Whitehorse river	7
Figure 3: A recent aerial image of Mountrath showing the areas of interest	8
Figure 4: Habitat map of Mountrath	9
Figure 5: The old weir on the Whitehorse river at the back of the former Quaker Burial Ground	11
Figure 6: The peaceful former Quaker Burial Ground in Mountrath	12
Figure 7: The two varieties of Ivy-leaved toadflax found growing in Mountrath	12
Figure 8: Stepping stones on the Whitehorse River, from the Poplar treeline to the playground	13
Figure 9: Aerial view of Mountrath showing locations of interest	16
Figure 10: Examples of 'Bug Hotels' re-using various materials	24
Figure 11 Grassy area in front of the Quaker Burial Ground could laid out as a bulb meadow	24
Figure 12 A bulb meadow at Tullynally Gardens, Co. Westmeath	24
Figure 13: Orchard with wildflower meadow and mown grass path beneath at Butler House, Kilkenny	24
Figure 14: Bat box on the east wall of St. Patrick's Hall, Ballacolla, Co. Laois	28
Figure 15: Two bat boxes on a tree at Abbeyleix Bog, Co. Laois	28

List of Tables

Table 1: List of Habitats present in the Mountrath area (Habitats classified according to Fossitt 2000)	10
Table 2: Actions to improve and maintain biodiversity in the Mountrath area	14
Table 3: Location key to map in Figure 9	17

1. Acknowledgements

Thanks to Laois County Council's Tidy Towns Facilitator and Environment Awareness Officer Ann-Marie Kelly and Laois Heritage Officer Catherine Casey for their support of this project and helpful comments and advice in putting together this report.

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 Paul Fetherstonhaugh and all of Mountrath Tidy Towns Committee for welcoming the LBAP project to Mountrath 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 Mountrath community and Laois County Council with the support of the Heritage Council. Dr Fiona Mac Gowan met with the Mountrath Tidy Towns representatives in June 2015 on behalf of the County Council to devise this plan. The meeting involved a walkabout of the Mountrath 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 Mountrath 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 Mountrath:



Elder



Mallard ducks



Wild rose

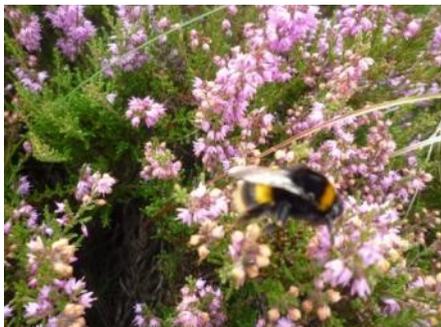
Why are Biodiversity & Ecology Important?

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

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

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

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



Bees pollinate crops and flowering plants



Hazelnuts—an ecosystem service of the Hazel tree

Ireland's National Biodiversity Action Plan

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

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

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

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

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

- Access to and safe use of biotechnology
- Provision of financial resources to achieve the Convention’s objectives, both nationally and to developing countries

The All-Ireland Pollinator Plan

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

Many of the actions outlines in this LBAP will benefit Ireland’s pollinators either directly or indirectly: leaving grass 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.



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 and maps which documents the Biodiversity highlights of the town of Mountrath
- The plan describes a number of actions that can reasonably be achieved in Mountrath within a set timeframe
- It also sets out some goals and aspirations to be achieved by the Tidy Towns Committee and the wider community in Mountrath.

4. Local Context

Location Details

Mountrath, one of the main towns of County Laois, is located towards the west of the county, on the Whitehorse river (see Figure 2) in the shadow of the Slieve Bloom mountains. The town has a long, busy and prosperous history, being situated on the main Dublin-Limerick road and serving a large, agricultural hinterland. This hinterland is clearly visible with the network of fields and hedgerows in the aerial image of the town in Figure 3.



Figure 2: The Whitehorse river

The river flows south through the town of Mountrath from its source in the nearby Slieve Bloom Mountains and on to meet the river Nore approximately 4km downstream. There is a beautiful walk along the length of the river right through the town which is rich with trees, plants and birdlife.

Mountrath has many old and new buildings, most with mature gardens which in themselves can be habitats for rare and threatened species. The town hosts a healthy population of Swifts which return from their winter migration each May. These birds need tall buildings for nest sites to raise their young and the Swifts in Mountrath appear to be using the beautiful St. Fintan's Church in the southwest of the town. Old out-buildings at the backs of houses and farmyards can provide great habitat for several important species such as Swallows and Barn owls.



Figure 3: A recent aerial image of Mountrath showing the areas of interest
(Source: modified by the Author based on an aerial photo from from www.bing.com/maps).

Figure 4 illustrates the various habitats of the Mountrath area and these are listed in Table 1. Many are commonly found and some are of a high biodiversity value.

Biodiversity-wise the most important areas are the nature-corridors formed by the network of hedgerows and the tree and hedge-lined banks of the Whitehorse river. Figure 3 shows how the hedgerows around Mountrath connect up different areas and provide hugely important travel, shelter and foraging (food supply for wildlife e.g. wild berries) routes which are of enormous importance for biodiversity.

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. 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.

As the habitat map shows, Mountrath is crossed by an area of conservation importance, known as an SAC. This follows the path of the Whitehorse river (Figure 5 & Figure 8) which is a tributary of the River Nore. The Nore and many of its tributaries are part of the River Barrow and River Nore Special Area of Conservation (SAC no. 002162).

SAC is a conservation designation of Europe-wide importance under the E.U. Habitats Directive. This means the Whitehorse and its banks are protected under European law for their importance as habitats of conservation value and their support for the life-cycles of several rare and endangered species. This also means that any activities carried out in the river or along its banks must first be cleared with the local National Parks and Wildlife Service staff (contact details in Appendix 8).

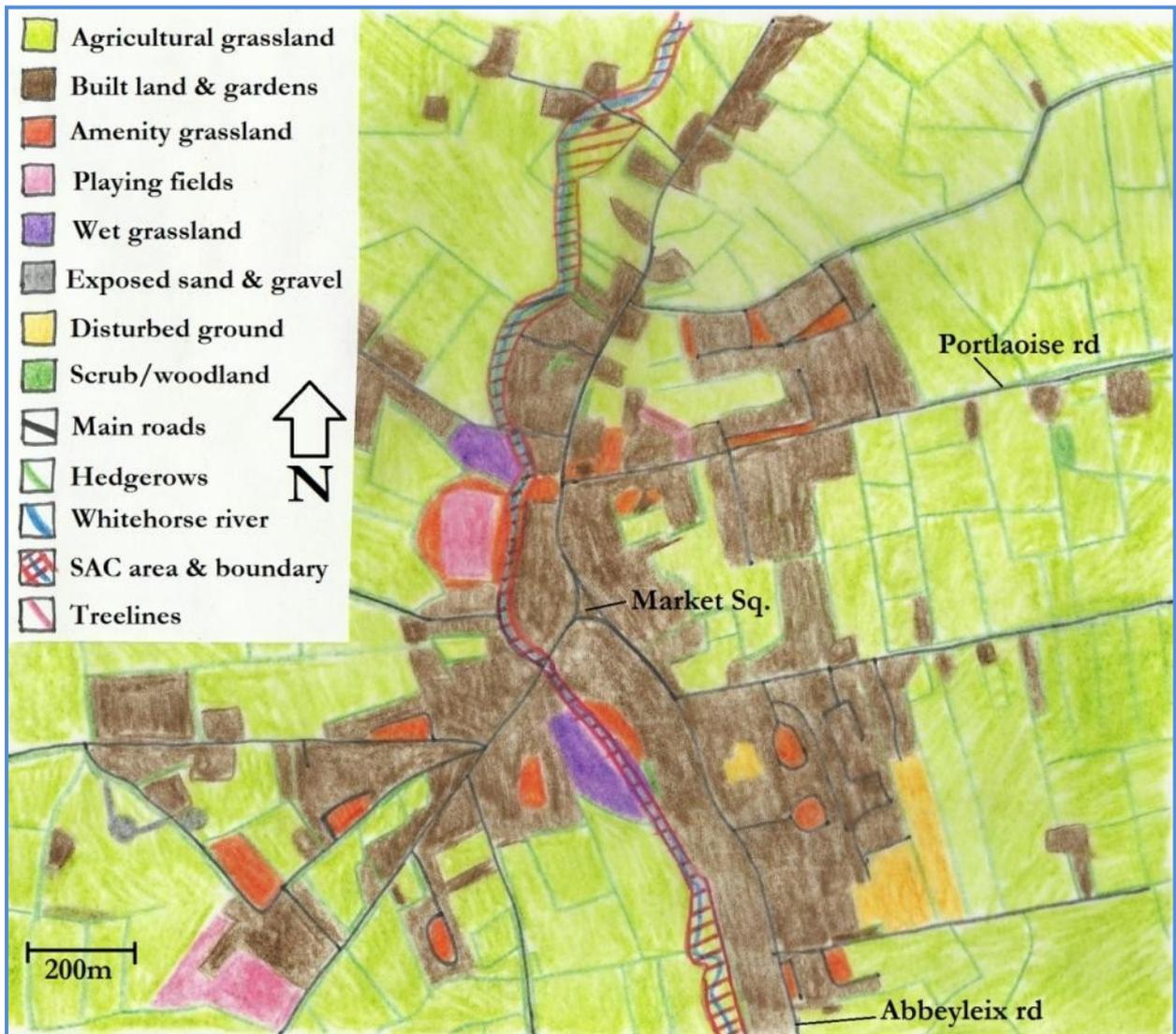


Figure 4: Habitat map of Mountrath.

Table 1: List of Habitats present in the Mountrath area (Habitats classified according to Fossitt 2000)

Code & habitat description (Fossitt 2000)	Corresponding habitat in Figure 4	Local Biodiversity value
BL3 Buildings & artificial surfaces	Built land and gardens	Medium
BL1 Stone walls & other stonework	Built land and gardens	Medium
GA1 Improved agricultural grassland	Agricultural grassland	Low
WL1 Hedgerows	Hedgerows	High
FW4 Drainage ditches	These are often found at the base of hedgerows	High
FW2 Depositing/lowland rivers	Whitehorse river	High
WS1 Scrub	Scrub	High
GA2 Amenity grassland	<ul style="list-style-type: none"> • Public open grassland • Playing fields (places where grassland would be fertilised/improved) • Cemetery/Graveyards 	Low
WS1 Scrub	Scrub/Woodland – there are a few small areas of scrub verging on woodland depending on the proportion of mature trees dotted around the edges of Mountrath.	High
ED Disturbed ground	This category covers some areas in Mountrath – mostly where building projects were started but then ceased and the disturbed ground has been recolonised with plants naturally.	Medium
ED1 Exposed sand & gravel	Quarry	Low
WL2 Treelines	Avenues of planted trees	High



Figure 5: The old weir on the Whitehorse river at the back of the former Quaker Burial Ground.

Enhancement of Biodiversity in Mountrath

In an urban environment, areas of open grassland often provide opportunities to enhance the biodiversity value of the town. Mountrath has a few small areas which host pockets of wildflowers or small groups of native trees and shrubs where biodiversity can be encouraged and enhanced. The former Quaker Burial Ground is an oasis of calm despite being beside the busy Main Street (Figure 6). At present the area is under grass and planted with several beautiful trees.

The Burial Ground is bounded by a high, old stone wall that has witnessed much of Mountrath's history. The wall features several species of plant which add to the character of the wall without causing any structural harm. The back wall which borders the Whitehorse river walk continues down in a southerly direction providing a boundary between old gardens and the river. An example of biodiversity in action was noted on these old walls which host two different wild varieties of the same species – the Ivy-leaved toadflax. This is a wildflower which is typically found on old walls in its purple form, however, the much rarer white form was noted on two separate old walls in Mountrath (Figure 7).



Figure 6: The peaceful former Quaker Burial Ground in Mountrath.



The usual purple variety of Ivy-leaved toadflax



The white variety of Ivy-leaved toadflax

Figure 7: The two varieties of Ivy-leaved toadflax found growing in Mountrath.

The Whitehorse river walk is a beautiful feature in the town providing a green corridor filled with biodiversity down the back of the Main Street linking the former Quaker Burial Ground and the old weir with the Wildlife area and Children's playground in the south of the town. The riverbank walk features several flowerbeds and shrubberies as well as some open lawn areas and a beautiful treeline of Poplars (Figure 8) by the Monks' Field and St. Fintan's Catholic Church.



Figure 8: Stepping stones on the Whitehorse River, from the Poplar treeline to the playground.

The Tidy Towns Committee is keen to do some work in various areas and proposed actions are detailed in Appendix 1. Wildflowers can be encouraged simply by slightly altering the grass-mowing regime. Many 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 at least until mid-May annually (ideally until July), these areas will feature many beautiful flowers of great biodiversity value before long.

Other habitats to be seen in the Habitat Map of Mountrath are the habitats of agricultural land which surround the town. Areas of improved agricultural grassland are of low biodiversity value because they are generally devoted to a sole crop of grass and therefore the variety of wildlife supported by this habitat is low. However, as mentioned above the hedgerows, ditches and drains that separate these fields are of high biodiversity value.

5. Proposed Biodiversity Actions

This LBAP proposes a list of actions achievable through community effort within a timeframe of five years (2015-2019). These actions are summarised in Table 2 below, with their locations shown on the map in Figure 9. The practical details of how and where to achieve these aims are further described in Appendix 1.

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

No.	Proposed Action	Proposed location for Action	Locations on map in Fig. 7
1	Erect bird boxes. Given the population of swifts in the town, a project to provide new nest sites for swifts could be considered.	In public spaces where there are trees; on the walls along the Whitehorse river walk; in the playground; in private gardens where the landowner is in agreement. Swift nest boxes have specific requirements, details in Appendix 2.	A. Quaker Burial Ground B. Northern half of River Walk E. Scrub wood at rear of playground F. Children's playground
2	Erect bat boxes	In public spaces where there are trees; along the Whitehorse river walk; in private gardens where the landowner is in agreement. Around the grounds of the three schools.	A. Quaker Burial Ground B. Northern half of River Walk E. Scrub wood at rear of playground F. Children's playground
3	Bird feeders	Install bird feeders where people can watch from a distance e.g. near benches in the playground and along the Whitehorse river walk.	A. Quaker Burial Ground B. Northern half of River Walk F. Children's playground
4	Plant biodiversity enhancing flowerbeds & pots	In the Tidy Towns tended flowerbeds and pots throughout Mountrath.	B. Northern half of River Walk and throughout the town.
5	Construct Bug Hotels	Any spot where the public can see them and learn of their importance e.g. the playground near the butterfly flowerbed.	F. Children's playground
6	Plant wildflower meadow	The grassy area at the front of the Quaker Burial Ground. (Figure 11).	A. Quaker Burial Ground D. Southern half of River Walk

No.	Proposed Action	Proposed location for Action	Locations on map in Fig. 7
7	Plant native trees & shrubs	<ul style="list-style-type: none"> • The shrubbery bed in the northern section of the river walk. • The ugly concrete wall at the back of the open grass area beside the library could be planted with Firethorns with different berry colours. • The central round flowerbed in Market Square could be planted with a circle of small trees such as Rowans or Whitebeams. <p>Any open grass areas where trees would not impair drivers' sight lines.</p>	<p>B: Northern half of River Walk</p> <p>E: Scrub wood at rear of playground</p> <p>G: Grass area to side of the library</p> <p>H: Market Square</p>
8	Gather & sow local, native seed	All the local hedgerows.	
9	Organise a local Biodiversity Day	Along the River, using the former Quaker Burial Ground and the Wildlife Area beside the Children's Playground	<p>B. Northern half of River Walk</p> <p>D. Southern half of River Walk</p> <p>E. Scrub wood at rear of playground</p> <p>F. Children's playground</p>
10	Plant a Community Orchard	A possible project for the front section of the Monks' Field thus linking the area around St Fintan's Church and school with the Whitehorse river walk and Wildlife area.	C. Monks' Field
11	Change the grass-mowing regime	<p>(a). The grassy area under the Poplar treeline along the southern section of the river walk.</p> <p>(b). Any of the suitable grass verges leading into the town. The idea is to mow just half the width of the grass verge on the road-side, leaving wildflowers such as Cow parsley to bloom on the hedge side of the verge. This creates very attractive roadways into the village in spring and summer while enhancing biodiversity at the same time.</p>	D. Southern half of River Walk
12	Identify areas where weed control is not necessary. Use natural methods of pest & weed control	Everywhere if at all possible!	

No.	Proposed Action	Proposed location for Action	Locations on map in Fig. 7
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.	D. Southern half of River Walk E. Scrub wood at rear of playground
14	Biodiversity-friendly hedgerow maintenance	Everywhere if at all possible!	Hedgerows
15	Biodiversity data gathering	All along the river walk and on into the Wildlife area and the playground.	B. Northern half of River Walk D. Southern half of River Walk E. Scrub wood at rear of playground
16	Monitor local area for invasive species & control where necessary	Anywhere in the Mountrath area.	B. Northern half of River Walk D. Southern half of River Walk



Figure 9: Aerial view of Mountrath showing locations of interest (see Table 3 for location key).

Table 3: Location key to map in Figure 9Figure 8.

Location letter	Name/Description of location
A	Quaker Burial Ground
B	Northern half of River Walk
C	Monks' Field
D	Southern half of River Walk
E	Scrub wood at rear of playground
F	Children's playground
G	Grass area to side of the library
H	Market Square

6. Progress Review

The actions achieved through this Plan will be reviewed annually by Mountrath 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 Mountrath

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; on the walls along the Whitehorse river walk; in the playground; in private gardens where the landowner is in agreement.	Years 1-5	Mountrath has a good population of Swifts whose national population has declined hugely in recent times. At present they are concentrated around St Fintan's Church but the erection of some Swift boxes on the north-east side of the town might encourage the Swifts to spread across the town. See Appendix 2 and the accompanying information pack for advice on nestboxes for Swifts and many other bird species.
Erect bat boxes	Maintain & increase bat species in the local area. Create public awareness.	In public spaces where there are trees; along the Whitehorse river walk; in private gardens where the landowner is in agreement. Around the grounds of the three schools.	Years 1-5	See Appendix 2 below and accompanying information. Why not launch the bat boxes with a community 'bat walk'? Contact Bat Conservation Ireland for ideas (www.batconservationireland.org).
Bird feeders	Help increase bird numbers. Create public awareness.	Install bird feeders where people can watch from a distance e.g. near benches in the playground.	Years 1-5	Free if voluntary labour and recycled materials are used. See www.rspb.org.uk and www.birdwatchireland.ie for designs. Ongoing maintenance through cleaning and re-stocking the feeders is very important.

Action	Reason	Location(s)	Timeframe	Method
Plant biodiversity enhancing flowerbeds & pots	Increase both plant and invertebrate biodiversity. Perennial plants decrease both cost and labour in the long-term as they rule out the need to buy new plants each summer. Taking care with what species are planted is very important for maintaining & enhancing bee and other pollinator species populations.	Any of the flowerbeds around Mountrath.	Once-off action within the 5 year timeframe, preferably early on so as to enjoy the lovely results sooner!	See list of suitable plants in Appendix 3. Native species are always best for maximising biodiversity and avoiding possible invasive species. Once planted, these perennial plants will continue to grow each year and many can be split and propagated as they get bigger – proving even better value! Also they provide good ground coverage, thus leading to less weeding work.
Construct 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 Figure 10).	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 10 for examples).

Action	Reason	Location(s)	Timeframe	Method
Plant wildflower meadow	<p>Increase both plant and invertebrate biodiversity</p> <p>N.B. It is imperative that any wildflower seed bought is from native Irish stock, there are a few Irish businesses doing this but many sell foreign-sourced seed which will affect our native wildflowers through cross-pollination and possibly introducing new diseases and invasive species – so beware and be aware!</p>	The grassy area at the front of the Quaker Burial Ground. (Figure 11). See Appendices 4 & 5 for further details.	Once-off action within the 5 year timeframe, preferably early on in order to enjoy the beautiful results sooner!	<p>The topsoil and turf layer will need to be stripped (to stop hungry grasses competing with your wildflowers) but once planted a wildflower meadow requires very little maintenance, just 2 mowings a year, first in late June/early July and the final cut in August or September, once the seed has had time to develop and scatter.</p> <p>Bulb meadows are a variation of the wildflower meadow (Figure 12). These are wildflower meadows with bulbs such as daffodils and tulips also planted. The bulbs flower in spring before the wildflowers, thus they lengthen the period of aesthetic interest but also more importantly they provide vital flowers early in the season for the insects that emerge from hibernation early e.g. queen bumble bees starting up new colonies.</p>
Plant native trees & shrubs	Everyone loves trees! Ensuring the plants are indigenous species from native stock ensures both biodiversity value and plant disease influx (think of Ash dieback disease!).	<ul style="list-style-type: none"> • The shrubbery bed in the northern section of the river walk. • The concrete wall at the back of the open grass area beside the library could be planted with Firethorns with different berry colours. • The central round flowerbed in Market Square could be planted with a circle of small trees such as Rowans or Whitebeams. • Any open grass areas where trees would not impair drivers' sight lines. 	Once-off action within the 5 year timeframe.	<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 is a relation of the Rowan and it also features beautiful flowers and berries providing interest through the seasons. The nearby Slieve Blooms are a stronghold of this uncommon species. These trees could form a striking feature in the bed in the centre of the Market Square. Please note that any actions proposed for the Market Square area must be done in consultation with the Area Engineer of Laois County Council.</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	Along the Whitehorse River, linking the Quaker Burial Ground and the Children’s Playground.	A once-off event, however, sometimes they prove popular with the local community and turn into annual events!	Ideas and guidelines can be obtained from the National Biodiversity Data Centre (NBDC)(www.biodiversityireland.ie). Even if your community doesn’t get to organise a Biodiversity Day, the NBDC are keen to receive any wildlife records made by the public either at their website or through their newly launched app.
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.	A possible project for the front section of the Monks’ Field thus linking the area around St Fintan’s Church and school with the Whitehorse river walk and Wildlife area.	Once-off action within the 5 year timeframe.	Irish Seed Savers Association (www.irishseedsavers.ie) 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. 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 & Cowslip to flower and set seed for more flowers next year.</p> <p>This will also have benefits for pollinators in terms of providing food.</p>	<p>(a). The grassy area under the line of Poplar trees along the southern section of the river walk.</p> <p>(b). Any of the suitable grass verges leading into the town. The idea is to mow just half the width of the grass verge on the road-side, leaving wildflowers such as Cow parsley to bloom on the hedge side of the verge. This creates very attractive roadways into the village in spring and summer while enhancing biodiversity at the same time.</p>	Every year	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!
Identify areas where no pest control is needed. Where necessary, use natural methods of pest & weed control	Pesticides and herbicides decrease biodiversity and leave residual chemicals in the soil which continue to reduce biodiversity into the future. Also they can be lethal for predators (e.g. Barn Owls) that ingest large doses through their prey (rats & mice).	Various different methods of natural pest control have been found to be successful. Encouraging natural methods of pest control throughout an area especially amongst private gardens would increase the local area's biodiversity.	Every year	Most methods are free but require manual labour e.g. weeding by hand. It is possible to make a mix with vinegar and salt, however, it has to be very carefully applied as it is indiscriminate in the plants it kills. Also the salt in the mixture sterilises the soil for two years i.e. destroying the soil's biodiversity and making it unsuitable for growing anything – not advisable! Therefore this is only suitable for removing weeds from the gaps between paving slabs/bricks.
Leave piles of leaves in quiet corners	For hibernating hedgehogs. The resulting leaves can be used by whoever needs it as a mulch the following spring, when hibernating hedgehogs have awoken.	Dark, quiet corners of public areas e.g. at the end of a hedgerow where there won't be any disturbance.	Every year	Free

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



Figure 10: Examples of 'Bug Hotels' re-using various materials

Also pictured is an example of the all-important information notice written here by pupils of Holy Trinity School Donaghmede, Co. Dublin for their Bug Hotel displayed at the Bloom Festival in 2013.



Figure 11 Grassy area in front of the Quaker Burial Ground could be laid out as a bulb meadow



Figure 12 A bulb meadow at Tullyally Gardens, Co. Westmeath



Figure 13: 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) and the British bird charity the RSBP (www.rspb.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) 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 14: Bat box on the east wall of St. Patrick's Hall, Ballacolla, Co. Laois



Figure 15: Two bat boxes on a tree at Abbeyleix Bog, Co. Laois

Appendix 3. Recommended species for planting

(a). Hedges

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

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



Holly leaves & berries



Crab apple in bloom



Guelder rose flowers



Guelder rose berries

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

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

(b) Wildlife-friendly tree species

Trees recommended for planting are:

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



Rowan/Mountain ash berries are favourites with the birds!

(c) Wildlife-friendly shrub species

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

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



Elder bush in full bloom



Broom in the wild

(d) Wildlife-friendly herbaceous species

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

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

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



Hardy Geraniums growing with roses in a flowerbed



Sedum blooms covered with Small Tortoiseshells



Aquilegia in the wild



Foxglove



Tutsan (*Hypericum androsaemum*)

Appendix 4. Hedgerow Maintenance Tips

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

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



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

Appendix 5: Management Regimes for Various Habitats

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

Grassland areas & road verges

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



Caterpillars of the Peacock butterfly, feeding on nettle.



The adult Peacock butterfly

Gardens, school grounds & open grassy areas and flower beds

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

Appendix 6: Invasive species identification, monitoring & control

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

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

- Grey squirrel
- American mink
- Japanese knotweed

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

Appendix 7. Helpful Reading Material

- Aalen, F.H.A.; Whelan, K. & Stout, M. (eds.) (1997). *Atlas of the Irish Rural Landscape*. Cork University Press, Cork.
- Bord na Móna (2010). *Biodiversity Action Plan 2010-2015* (available to download at www.bordnamona.ie).
- Cullenagh Community Group (2011). *Cullenagh, digging and ditching an authentic land, a heritage study*.
- Department of Arts, Heritage & the Gaeltacht (2011). *Actions for Biodiversity 2011-2016*. Ireland's National Biodiversity Plan (available for download at www.ahg.gov.ie)
- Doogue, D. & Krieger, C. (2010). *The wildflowers of Ireland*. Gill & Macmillan, Dublin.
- Fairley, J. (2001). *A basket of weasels*. Published privately by the author, Belfast.
- Feehan, J. (1983). *Laois, an environmental history*. Ballykilcavan Press, Stradbally, Co. Laois.
- Fossitt, J. A. (2000). *A Guide to Habitats in Ireland*. The Heritage Council, Kilkenny.
- Hayden, T. & Harrington, R. (2000). *Exploring Irish mammals*. Dúchas, the Heritage Service, Dublin 2.
- Mabey, R. (1989). *Food for free*. HarperCollins Publishers.
- Mabey, R. (1996). *Flora Britannica*. Sinclair-Stevenson, London.
- MacCoitir, N. (2003). *Irish trees, myths, legends & folklore*. The Collins Press, Cork.
- Mitchell, F. & Ryan, M. (1997). *Reading the Irish Landscape*. Town House, Dublin.
- Mullarney, K.; Svensson, L; Zetterström, D.; & Grant, P. (1999). *Collins Bird Guide*. HarperCollins Publishers.
- National Biodiversity Data Centre (2015) All-Ireland Pollinator Plan 2015-2020. National Biodiversity Data Centre. www.biodiversityireland.ie/pollinator-plan
- Parnell, J. & Curtis, T. (2012). *Webb's An Irish Flora*. Cork University Press, Cork.
- Praeger, R. L. (1937). *The way that I went*. (Published by the Collins Press, Cork in 1997).
- Tubridy, M. & Associates. (2010). *Laois Habitats Survey*. Report prepared for Laois Heritage Forum, County Hall, Portlaoise (www.laois.ie/heritage).

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

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

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

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

Appendix 9. Definitions & Explanations

1. Biodiversity= the diversity of life

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

Biodiversity includes the diversity of:

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

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

3. What is the importance of Biodiversity and Ecology?

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: River Barrow and River Nore Special Area of Conservation (SAC) Site Synopsis

The following text is a description of the River Barrow and River Nore SAC of which the Whitehorse river (also known as the Mountrath river) is a part. It gives an idea of the biodiversity value and importance of the river which runs through Mountrath which is part of a much bigger ecosystem that is of not just national but European importance. 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

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 16th 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 Aughnabrisky, Aughavaud 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.



www.laoistidytowns.ie