

# Coon Biodiversity Action Plan

Prepared for Coon Tidy Towns and Heritage Group

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**Organisation Code:** CHY No OGA005740



*Black River near Peace Garden*

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*Betsy Hickey and Mary Tubridy October 2021*

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## Acknowledgements

Particular thanks to Patricia Murphy who conceived of this project and provided information on folklore; Rose Walsh who assisted with fieldwork and everyone else in Coon Tidy Towns and Heritage Group who allowed researchers to poke around the village and attended the meeting to discuss the project in August.

In line with the Community Foundation for Ireland's requirements, all datasets collated as part of this survey will be issued to the National Biodiversity Data Centre (NBDC).

## Summary

Between 2019 and 2021 research was carried out in Coon to develop a Biodiversity Action Plan on behalf of Coon Tidy Towns and Heritage Group. The study area for the BAP is also covered by the Barrow Nore Special Area of Conservation (SAC). Assistance with research was provided by two members of the Tidy Towns and Heritage Group.

Fieldwork revealed these features of biodiversity value in Coon:

- Presence of good quality water in the rivers within the SAC
- Various wetland habitats supporting plant species associated with the SAC
- Small area of ancient woodland containing an active badger sett
- Diversity of native plants in the study area including two locally uncommon species *Orchis mascula* in the woodland and *Ranunculus omiophyllus* in the river
- Presence of one red listed bird species (Swift) and four amber listed species (Sand martin, Willow warbler, Goldcrest and House sparrow).

Coon Tidy Towns and Heritage Group has particular potential to carry out actions which will enhance biodiversity as they have established a native type woodland in the village, they have recently made contact with Norevision, the national Swift survey, the Community Water Officer from Local Authority Waters Programme (LAWPRO), and the local garden centre actively promotes planting for pollinators.

In 2021, Coon Tidy Towns and Heritage Group sponsored a competition in the local national school called '*Best Wildlife Friendly Window Box/Container*'. This interaction with the school brought additional knowledge and awareness on the importance of pollinators in the community.

## *Coon Biodiversity Action Plan*

The Biodiversity SWOT was followed by a list of actions. An appendix to the plan provides background information on local biodiversity and rationale for management actions in different habitats.

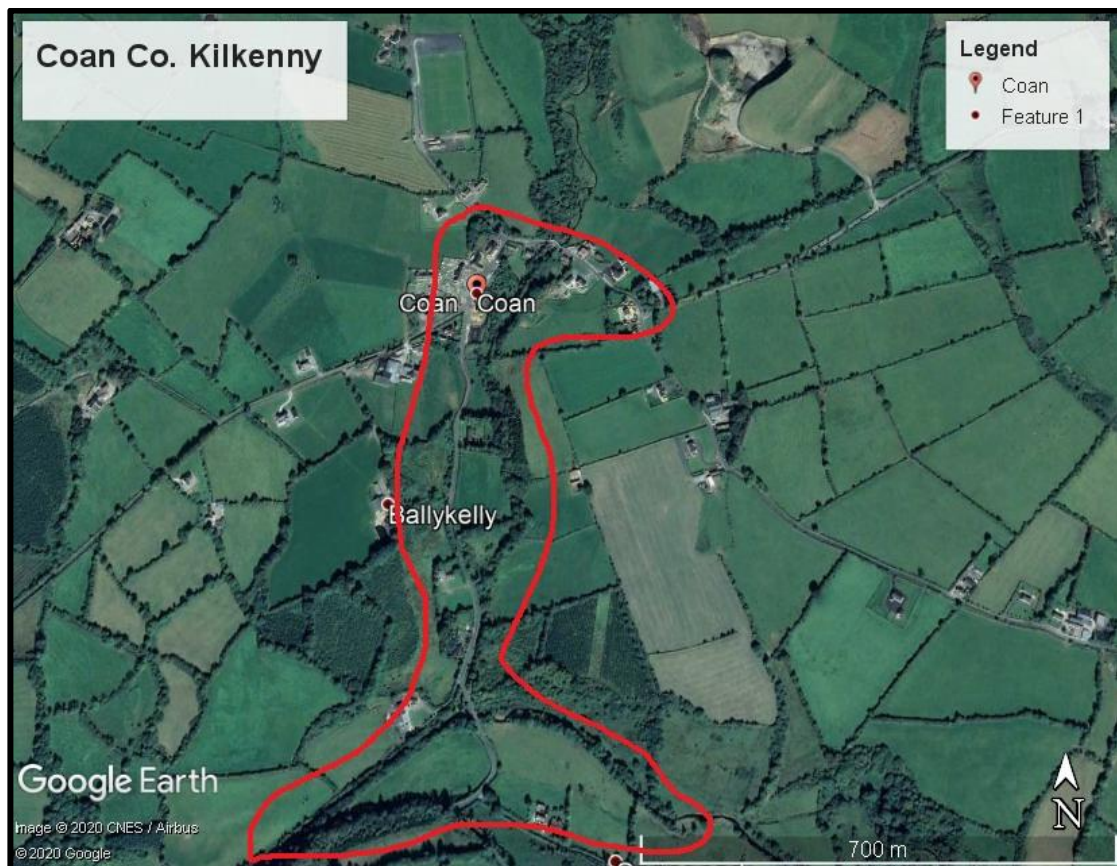
The priority of the BAP for Coon is to communicate the significance of the internationally important Natura site to the local community. The plan contains recommendations for actions to be carried out by a range of sectors including the local primary school, householders, owner of woodland, owners of hedgerows, the Local GAA club and EIR to enhance the biodiversity value of a wide range of habitats present in Coon.

The plan contains detailed specifications for landscaping in many public spaces which will benefit biodiversity. The majority of these areas are already being managed by Coon Tidy Towns and Heritage Group.

## Part 1: Biodiversity of Coon

### 1.1 Introduction

Coon is situated in north-east Kilkenny, c 8km east of Castlecomer. The area which is the subject of the plan (Figure 1) consists of Coon village and surrounding countryside, particularly the land associated with two tributaries which flow into the Nore, the Black River which is near the village and the Dinin which joins it south of the village.



**Figure 1: Area subject to Biodiversity Action Plan within the townlands of Coon East and Coon West**



**Figure 2: Land within the study area and also in the Barrow Nore Special Area of Conservation (SAC) (Sitecode No. 002162)**

Most of the study area lies within the Barrow Nore SAC. The site synopsis for the SAC (in Appendix 1) mentions the River Dinin. It highlights the following habitats and species of particular importance to the SAC which might occur in the vicinity of Coon. These are the habitats:

- Floating River Vegetation
- Dry Heath
- Hydrophilous Tall Herb Communities
- Petrifying Springs
- Old Oak Woodlands
- and the species
- Desmoulin's Whorl Snail (*Vertigo moulinsiana*)
- Freshwater Pearl Mussel (*Margaritifera margaritifera*)
- White-clawed Crayfish (*Austropotamobius pallipes*)
- Brook Lamprey (*Lampetra planeri*)
- River Lamprey (*Lampetra fluviatilis*)
- Atlantic Salmon (*Salmo salar*)
- Otter (*Lutra lutra*)
- Killarney Fern (*Trichomanes speciosum*)
- Nore Freshwater Pearl Mussel (*Margaritifera durrovensis*)

Within the village and environs the SAC designation covers the watercourses (Dinin and Black Rivers), all the land between the Black River and street (minus garden and house at corner, and intensively managed field). It includes land south of the village in the steep fields with old woodland. Some of the land within the SAC beside the village has been developed as amenity areas; for car parking and for a waste water treatment plant.

Coon Tidy Towns and Heritage Group commissioned this plan to promote pride in the Village, specifically to:

- Raise awareness of the need to audit, preserve and maintain their existing wildlife, habitats and food sources
- Create a pleasant clean environment which supports wildlife
- Gain more information about wildlife and nature in surrounding areas
- Compare the findings of the year 2000 audit of the flora and fauna of the river valleys compiled by Dr. Patrick Jones with the results of future biodiversity auditing of the area.
- Carry out an in depth examination of water quality and pond life in the local Dinin and Black Rivers.

The biodiversity plan should help the Group carry out any work in their village in a way that is sustainable and that promotes favourable conditions for wildlife. This in turn should satisfy and fit in Tidy Towns criteria for Sustainable Resource Management, Landscape and Open Spaces and Wildlife, Habitats and Natural Amenities.

Coon has been an entrant in the Tidy Towns since 1998. It achieved a mark of 31/50 due to the range of studies which have been commissioned and work carried out to encourage wildlife friendly planting. This work includes the establishment of a native woodland in the land between the Black River and village. In 2021 liaison was established in 2021 with the local Primary School the organiser of the national Swift Survey and Kilkenny Water Protection Office.



**Figure 3: Hugel Kultur composting beds in new woodland**

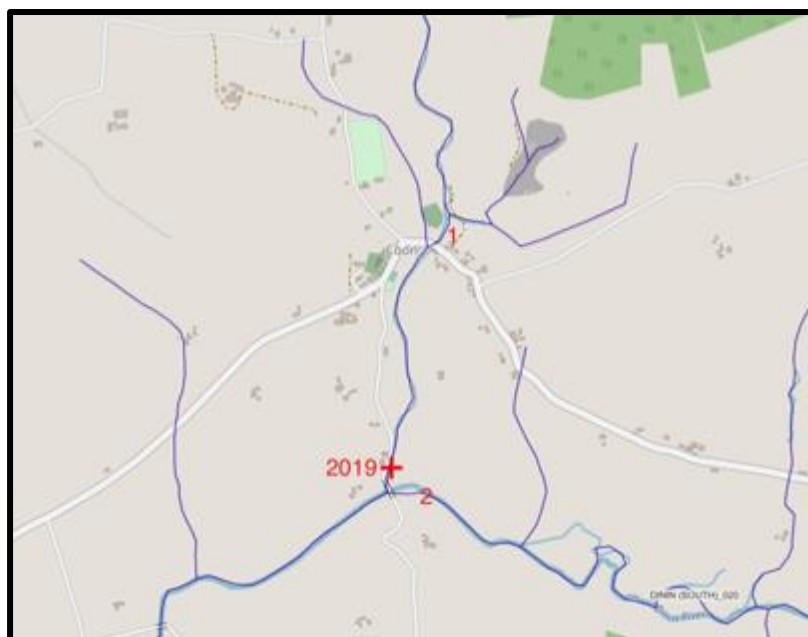
## **1.2 Methodology**

Desk top research focussed on an examination of information compiled by the community on placenames, historic mapping and interrogation of the National Biodiversity Ireland data bases to provide information on the rare species associated with the SAC and invasive species. Fieldwork took place in 2019-2021 and involved Dr Betsy Hickey (hedgerows/ecology/horticulture), Dr Mary Tubridy (ecology /habitat management/environmental education), Dr Julian Reynolds (freshwater biology/management) and Joe Adamson (ornithology/management).

Betsy Hickey compiled plant species lists in all habitats including a sample of hedgerows, took photos, made notes about improvements needed and prepared a draft habitat map based on Fossitt (2000) and Smith et al (2010). While work on hedgerows produced species lists for sample sections in four locations information collected was not sufficient to carry out a comprehensive hedgerow appraisal according to Foulkes et al, (2013)

In 2019, the Local Authority Waters Programme (LAWPRO) carried out a Small Stream Impact Score (SSIS) on the Dinin River at Coolcullen Bridge, Coon. As part of this report and Biodiversity Action Plan (BAP) Julian Reynolds carried out fieldwork in 2019 and August 2021 in freshwaters to provide a score compatible with EPA and Small Stream Risk Assessment systems. In 2019 one site was sampled. In 2021 two sites were examined. Figure 4 shows their location.





**Figure 4: Location of sampling sites for freshwater monitoring in 2019 and 2020**

At each site, two kick samples were taken, of 60 and 120 seconds respectively, using a sterilised 20 cm square net with a mesh size of 1 mm. Organisms were washed into a white tray in the field. Relative abundance was assigned from + to +++.

For the Water Quality methodology, each organism was identified, counted, and assigned to a Macroinvertebrate Sensitivity Group (A to E, with A the most sensitive to pollution, and E the most tolerant), and then the total mix of organisms is assigned a Q value ranging from heavily impacted (Q1) to the stream's ideal unimpacted state (Q5). For the implementation of the EU Water Framework Directive, the unimpacted state is known as its 'Reference Condition', to which it could ideally be returned.

For smaller streams, the Small Stream Risk Assessment was used to indicate if pollution is an issue. These required a detailed identification of mayfly and stonefly nymphs, not always possible in the field. SSRA (SSIS) scores were calculated for the 2019 sample but not for the streams sampled in 2021.

Joe Adamson carried out a bird survey on 2<sup>nd</sup> and 11<sup>th</sup> July 2020, between the hours of 0900 and 1800 when weather was bright, warm and sunny. All areas were surveyed by systematically walking and recording birds heard and observed within the study area. Birds recorded were assessed using system in Gilbert et al, (2013).

The digital habitat map was produced by Donal Storey a GIS specialist who has prepared habitat mapping on many occasions for Mary Tubridy and Betsy Hickey. Mary Tubridy drafted the BAP based on the results of all desk research and fieldwork and direct inspection of the study area in August 2020 when consultation occurred with the community.

### **1.3 Results of desk research**

The examination of geological mapping showed that siliceous sandstones occasionally with thin bands of coals underlie soils in Coon. The presence of these rock types explains why limekilns were built around the village. There were two limekilns in the Coon area (Patricia Murphy, pers.comm.). One is still standing in Walsh's Inch Field, and the other was just above the Peace Garden. The siting was crucial- close to the rivers in which limestone was exposed. Limestone slabs were manually prised from the bedrock and burned in the kiln. The final product from this process was lime for spreading on the land thus making acidic soils more productive.

The account of the building of the local castle mentioned that it was built of *greenstone and grouting*. A particular geological feature of historic interest is the flat rock in a secluded glen in Cruttenclogh near Coon Village which served as a Mass Rock during Penal period.

According to local knowledge stones/sand carried downstream in the rivers during winter floods were the prime road building materials used by Local Authorities in the 1930s. Loads of these materials were loaded into carts, pulled by horses (Patricia Murphy, pers.comm.)

Local folklore and place name research has revealed that aspects of the natural environment which were noticed by the community. The name Coon is associated with the river. According to Joyce, (1922) the word Cuan signifies a bend or winding of a river or harbour.

Locally the word *Strand* is still used for a shallow river crossing, such as that immediately upstream from the old creamery in the village and after which the local pub was named (Patricia Murphy, pers.comm). This name is commonly given to the adjacent land beside shallow sections of rivers in the Midlands. Newbridge on the Liffey has an area know as the Strand in the local park. Low-lying fields with good soil, not necessarily prone to flooding near the river are known as *Inches* (Patricia Murphy, pers.comm). This term is commonly used for such land in other counties in the southeast.

Certain areas were given names which referred to features of the natural environment such as Coolcullen-hill of the holly, Cuil an tobar-angle of the well, Coolrinchy-site of Mass Rock, Croghtenclogh-little croft of the stones and moin gabhar-goats bog (Patricia Murphy, pers.comm).

Local folklore states that it was common to see salmon swimming upstream to spawning areas and salmon (caught illegally) supplemented the diet of local families. Trout fishing continues, using the age-old method of attaching a copper wire loop to a pliable hazel rod. In prehistoric times Fulacht Fiadh- were used to cook animal carcasses. These were shallow man made ponds close to a river or large stream. Large rocks or boulders were heated on fires then added to the water to boil water for cooking animal hunting carcasses. If traces are still present they are identified by the presence of semi-circular low mounds of stones. Together with important buildings and all of archaeological interest they are now on maps accessed through [www. archaeology.ie](http://www.archaeology.ie).

Soil type in Coon suggests that the original vegetation in dry land was a type of woodland containing oak (both species), Birch, Holly and Rowan with some Hazel and Ash.

The plants and nuts of Water Cress, Sorrel and Hazel were collected and eaten (Patricia Murphy, pers.comm).

Water cress grew in the feeder streams of the Dinin and Black Rivers. While now considered a health food it was used with free range hard boiled eggs as a source of iron. Sorrel abounded in riverside fields, and hazel trees flourished on river banks, with hawthorn, wild roses (rose hips) and elder.

Sedges were cut and dried and used for roofing byres and animal winter bedding. Rushes were used for similar purposes, to save on use of straw-which was saved for feeding purposes.

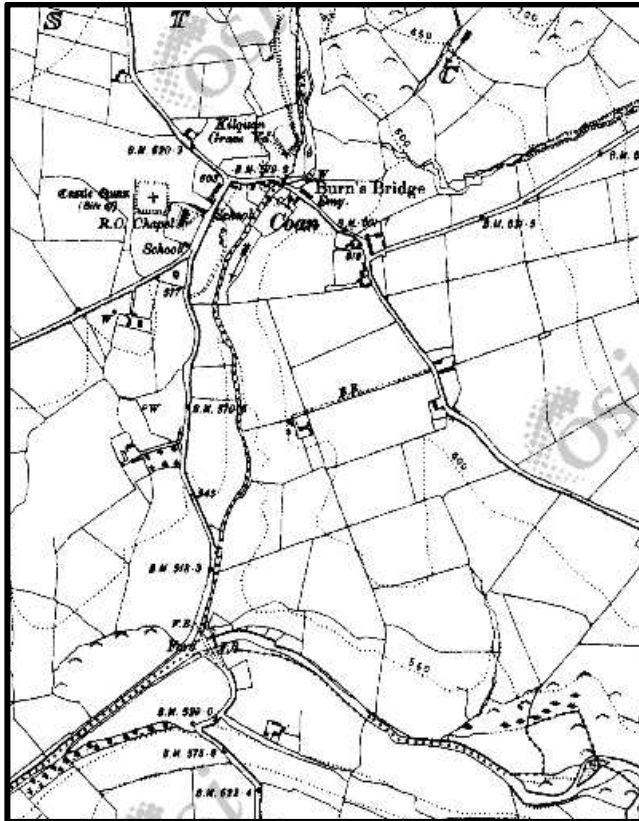


Figure 5: 19<sup>th</sup> century map of Coon and surrounds

The first detailed map of the area (Figure 5) showed that the rivers were the most important features of biodiversity value. Mature trees were principally associated with a narrow band of woodland on a steep hill near where the two rivers met (bottom left of map). Elsewhere hedgerows acting as field boundaries were important reservoirs of terrestrial biodiversity.

The results of desk research (Table 1) indicated that there was a high risk of two invasive species: Himalayan balsam and Giant Hogweed occurring around Coon.

**Table 1: Invasive species desk research**

Species English name	Species Latin name	Distance from Coon Km (NBDC mapping)
Japanese knotweed	<i>Fallopia japonica</i>	7
Bohemian knotweed	<i>Fallopia japonica</i> X <i>sachalinensis</i>	>20
Giant knotweed	<i>Fallopia sachalinensis</i>	>20
Himalayan knotweed	<i>Persicaria wallichii</i>	9
Giant hogweed	<i>Heracleum mantegazzanum</i>	0.5
Nuttall's waterweed	<i>Elodea nuttallii</i>	11
Giant rhubarbs	<i>Gunnera tinctoria</i>	>20
Giant rhubarbs	<i>Gunnera manicata</i>	>20
Himalayan balsam	<i>Impatiens glandulifera</i>	0.2
Hottentot fig	<i>Carpobrotus edulis</i>	>20
Rhododendron	<i>Rhododendron ponticum</i>	7

Interrogation of the National Biodiversity Data Centre data (NBDC) sets suggested that with the exception of otter there were no records of the rare plant and animal species associated with the SAC in the environs of Coon. Records of otter date to a national otter survey carried out in the 1980's (Smal, 1995).

## 1.4 Results of field studies 2019-2021

### 1.4.1 Introduction

Habitats in Coon are shown in Figure 6. A summary account of habitats in Table 2 is followed by more detailed information about native plants, birds and freshwater biodiversity in the locality. Original reports provided to Mary Tubridy by Joe Adamson (Birds) and Julian Reynolds (freshwater biodiversity) are available on request.

The checklist of plants is in Appendix 2 which is annotated to distinguish native species and plants associated with hedgerows. Appendix 3 titled *Biodiversity Management: Background information and general guidelines* contains information on the following topics:

- Where is a good place for biodiversity?
- Legal protection for areas and species
- Habitats and how to develop them (woodlands, shrubberies and wetlands)
- Gardening for biodiversity
- Artificial habitats for birds, bats and insects
- Support for community based initiatives
- Developing a partnership with the local primary school
- Resources needed to support local learning about biodiversity

### 1.4.2 Habitat diversity

Habitats found in Coon include various types of grasslands, woodlands and wetlands.

While the wetland habitats in Coon are not examples of the rare types listed in the EU Habitats Directive for which the SAC has been designated they are connected to those habitats. The wetland habitats in Coon share species associated with the more other sections of the river.

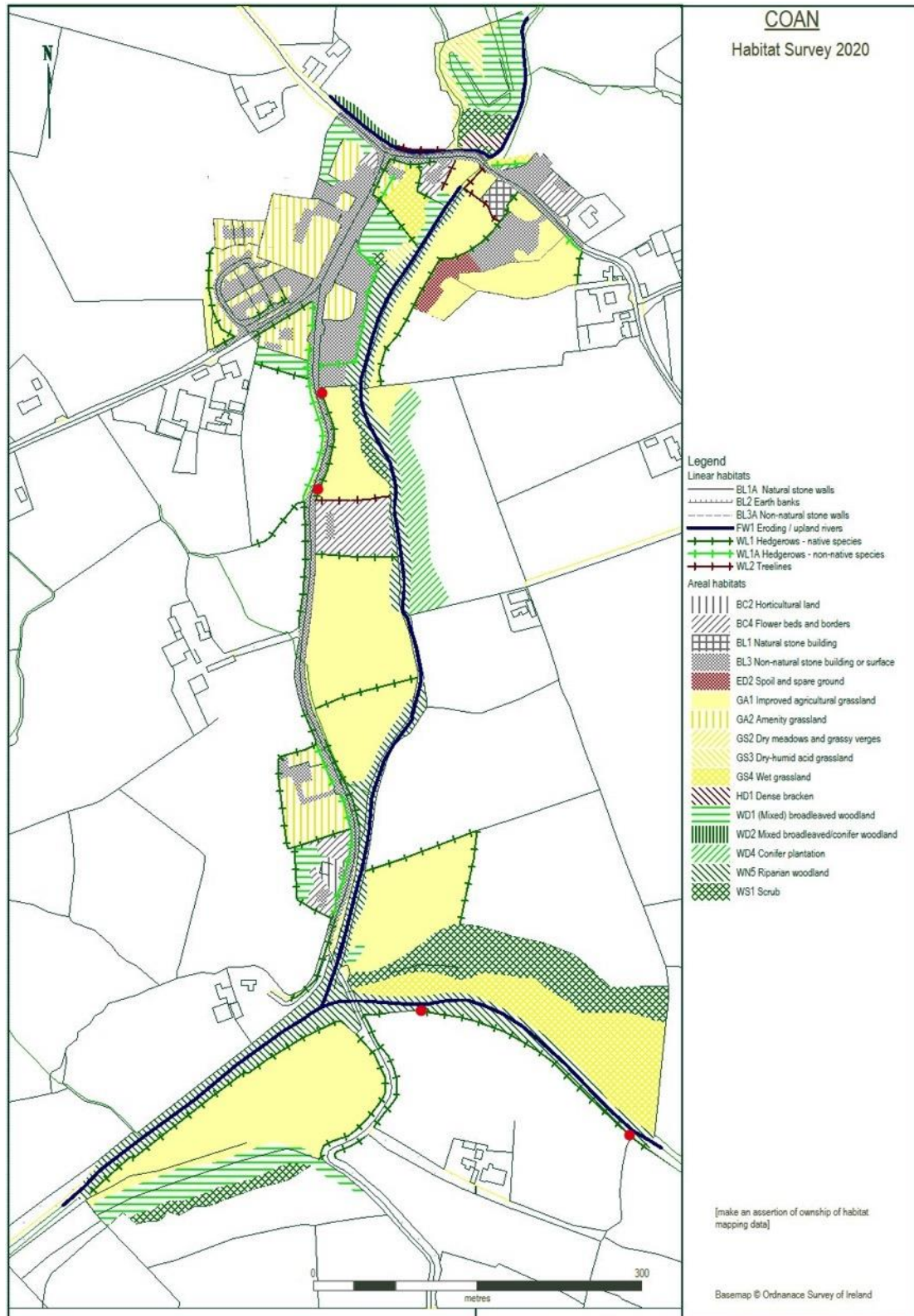


Figure 6: Habitats in Coon. Hedgerows subject to particular examination of their plant species are indicated

Table 2 contains an assessment of the rarity of the habitats found in Coon and summarises their general interest for biodiversity. Note, in the column 'rarity', 1 signifies that it is not rare and 5 is very rare.

**Table 2: Habitats in Coon and summary of their general biodiversity interest**

Habitat name	Fossitt Code	Rarity (on a scale from 1-5)	Biodiversity Interest
Horticultural land (Garden Centre)	BC1	4	Garden Centre in Coon unique in encouraging biodiversity friendly gardening.
Flower beds and borders (various locations)	BC4	1	Flower beds in Coon are generally good for biodiversity. All have potential for improvement.
Natural Stone Walls in buildings and bridges	BL1	2	Habitat for three species of ferns and specialised plants. Could be important for bats and basking insects.
Earth banks (bounding roads)	BL2	2	Supports tall grassland vegetation GS2
Other buildings and artificial surfaces (not of stone)	Bl3	1	Of low biodiversity value unless infrastructure is provided for species i.e. bird and bat boxes etc. See suggestions in Appendix 3
Spoil and Bare Ground	ED2	1	Interesting to observe natural colonisation by native plants which are important for pollinators.
Improved agricultural grassland	GA1	1	Poor plant and animal biodiversity which is maintained through intensive management.



Habitat name	Fossitt Code	Rarity (on a scale from 1-5)	Biodiversity Interest
(intensively managed grasslands in farms)			
Amenity grassland improved  (in lawns)	GA2	1	Generally poor plant and animal biodiversity as a result of intensive management. Occasionally good biodiversity if original grassland is retained and management lax as in the GA2 in front of the Community Centre where eight native forbs are present.
Dry Meadows and grassy verges  (unmown grasslands beside roads)	GS2	3	Good for pollinators as almost vegetation is native. Plants are allowed flower and set seed. Excellent GS2 on most roadside verges around Coon.
Dry humid acid grassland  (In field)	GS3	4	Unusual semi- natural grassland maintained by farm management to provide forage for farm animals.
Wet grassland  (In low lying field beside the Black River)	GS4		Important location for native species tolerant of wetland conditions such as Meadowsweet and Purple Loosestrife
Dense bracken  (in field)	HD1	2	Depending on the density of bracken could support interesting grassland. If only bracken then of low biodiversity value

Habitat name	Fossitt Code	Rarity (on a scale from 1-5)	Biodiversity Interest
(Mixed) Broadleaved woodland	WD1	3	Supports an excellent diversity of native trees and shrubs including Ash (now dying due to Ash die back), Hazel, Hawthorn, Holly and Rowan. and woodland herbs including Wood sorrel, Early Purple Orchid and Pignut. Badger sett in woodland south of Coon at Grid reference 5938/ 70088. Particular potential of this woodland convert to WN type.
Mixed broadleaved/conifer woodland	WD2	3	Supports less valuable biodiversity compared to WD1 as trees include non-native species.
Conifer plantation	WD4	1	Supports less valuable biodiversity compared to WD1 and WD2 as absence of light prevents growth of other trees, shrubs and even woodland herbs
Riparian woodland (beside rivers)	WN5	2	Trees usually natives fringe rivers.
Scrub	WS1	3	Good for birds and pollinators dominated by Bramble and Hawthorn.
Eroding /upland rivers (both rivers)	FW1	4	Important for specialised plants and invertebrates linked to wider areas.
Hedgerow-native species	WL1	3	Supports a mainly native Ash, Hawthorn and

Habitat name	Fossitt Code	Rarity (on a scale from 1-5)	Biodiversity Interest
			Blackthorn and herbs tolerant of shading. Appendix 2 lists plant species found in sampled hedgerows.
Hedgerow non-native species	WL1A	1	Of lesser value to native biodiversity, unless species pollinator friendly are present, they are dense at chest height and do not contain <i>Leylandii</i> .
Treeline	WL2	1	Of lesser value to native biodiversity compared to WL1's unless forming a linking corridor or/and consisting of mature native species (i.e. not <i>Leylandii</i> ).

### 1.4.3 Plant diversity

Fieldwork in Coon has revealed the presence of 153 native plants and 18 non-natives established in the wild (see Appendix 2). Features of the flora of particular interest are:

Presence of *Ranunculus omniophyllus* Round leaved crowfoot and *Orchis mascula*, Early purple orchid. The former is present in the river and the orchid was found in the old woodland south of the village. Neither had been recorded in the vicinity of Coon and are characteristic of undisturbed habitats.



**Figure 7: Early Purple Orchid  
Coon Woodland**

Typically hedgerows are the most species rich habitat in the locality supporting 87 native plants and 7 non-natives.

The dominance of Ash in hedgerows and almost complete absence of elm and oak is noteworthy in the locality. Oak was probably present in WD1 woodland but then cut down and not replaced. As many Ash show signs of Ash die back it is likely that the locality will soon lose all its Ash trees.

Presence of Himalayan Balsam an invasive alien species near the river throughout the locality is noteworthy. Its presence is not unexpected given its distribution locally. Knotweed was not found in Coon.

### 1.4.4 Bird Diversity

A total of 31 species was recorded at the time of the site visits. See Table 3 for an account of bird diversity. This number of species is a reflection of the variety of habitats found within the village and the surrounding area.

**Table 3: Bird species recorded during the Summer 2020 bird survey**

Species highlighted in red are of particular interest

Species	Comments
<b>Grey Heron</b> <i>Ardea cinerea</i>	Observed along the Dinin River
<b>Buzzard</b> <i>Buteo buteo</i>	One was observed flying high over the village. None were observed breeding within the survey boundary although it is likely that they breed in the surrounding area
<b>Wood Pigeon</b> <i>Columba palumbus</i>	Frequent flyover. A common species in farm and woodland in Ireland
<b>Collared Dove</b> <i>Streptopelia decaocto</i>	Heard and observed in the village
<b><u>Swift</u></b> <i><u>Apus apus</u></i>	Observed over the village on the 2 <sup>nd</sup> July but absent on the second visit.
<b>Barn Swallow</b> <i>Hirundo rustica</i>	Very common over the village
<b>House Martin</b> <i>Delichon urbica</i>	Common over the village
<b>Sand Martin</b> <i>Riparia riparia</i>	Observed along the river south of Coon village. Likely to be breeding in the area
<b>Pied Wagtail</b> <i>Motacilla alba yarelli</i>	Observed feeding on the roadside south of the village
<b>Wren</b> <i>Troglodytes troglodytes</i>	Commonly heard and observed throughout the survey area
<b>Robin</b> <i>Erithacus rubecula</i>	Commonly heard and observed throughout the survey area
<b>Dunnock</b> <i>Prunella modularis</i>	Occasional in the village in residential gardens
<b>Song Thrush</b> <i>Turdus philomelos</i>	Two observed in the survey area southwest of the village
<b>Blackbird</b> <i>Turdus merula</i>	One observed in Coon village. A common species in Ireland
<b>Blackcap</b> <i>Sylvia atricapilla</i>	Frequently heard throughout the survey area

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Species	Comments
<b>Willow Warbler</b> <i>Phylloscopus trochilus</i>	Singing in woodland southwest of the village
<b>Chiffchaff</b> <i>Phylloscopus collybita</i>	Heard singing in woodland southwest of the village
<b>Goldcrest</b> <i>Regulus regulus</i>	Occasional in the church grounds and surrounding gardens
<b>Great Tit</b> <i>Parus major</i>	One observed south of Coon village
<b>Coal Tit</b> <i>Pariparus ater</i>	Occasional in the church grounds and surrounding gardens.
<b>Blue Tit</b> <i>Cyanistes caeruleus</i>	Occasional in surrounding gardens
<b>Long-tailed Tit</b> <i>Aegithalus caudatus</i>	Observed in woodland by the river, southwest of the village
<b>Magpie</b> <i>Pica pica</i>	Frequent throughout survey area
<b>Jackdaw</b> <i>Corvus monedula</i>	Breeding in Coon village. Common
<b>Rook</b> <i>Corvus frugilegus</i>	Occasional flyover. A common species
<b>Hooded Crow</b> <i>Corvus cornix</i>	Occasional flyover
<b>Starling</b> <i>Sturnus vulgaris</i>	Occasional flyover. Breeding in the village. Juveniles common
<b>House Sparrow</b> <i>Passer domesticus</i>	Observed in the village. A declining species in Ireland
<b>Chaffinch</b> <i>Fringilla coelebs</i>	Observed overhead. A common species in Ireland
<b>Goldfinch</b> <i>Carduelis carduelis</i>	Occasional flyover
<b>Bullfinch</b> <i>Pyrrhula pyrrhula</i>	Observed in vegetation by the river

Birds of particular interest are Swift (Red List) and House Sparrow, Goldcrest, Willow Warbler and Sand Martin (Amber List). Swift has disappeared from many former breeding areas in Ireland. As a result there is an active project run by BirdWatch Ireland to record their presence and provide nesting places on buildings. Amber listed birds are considered vulnerable to decline throughout Ireland.

### **1.4.5 Freshwater biodiversity**

Examination of freshwater biodiversity revealed the presence of the following species of freshwater invertebrates in the watercourses around Coon.

- Heptageniid mayfly nymphs
- *Ecdyonurus* nymphs
- Baetid nymphs
- Leuctrid stonefly nymphs
- Caenid nymphs
- Naked caddis larvae
- Blackfly larva *Simulium* sp.
- Irish shrimp *Gammarus duebeni*
- Diving beetles (Dytiscidae)
- Chironomid larvae
- Water beetles (not Elmidae)
- Riffle beetle (Elmidae)

Using these invertebrates as indicators of water quality it was discovered that both river sites appear to be of high quality and are unpolluted, with an abundance of sensitive species and absence of very tolerant forms. From the sampling carried out, both rivers have been graded at least Q4 and probably Q 4-5. An earlier sample (March 2019) from the Coon tributary just upstream of where it joins the Dinin River, consisting of 120 seconds netting and 60 seconds stone washing, indicated that this tributary had a good quality status (Q4-5) also.

The 2019 findings were worked up to provide a Small Stream Impact Score of 8.8, based on abundant and varied stoneflies and mayflies, and an absence of snails or *Asellus*. No Trichoptera (caddis) larvae were seen in the 2019 sample, whereas naked caddis (Philopotamidae, Group C) were present in the 2021 samples. (Source of 2019 data is from LAWPRO).

## **Part 2: Biodiversity Action Plan**

### **2.1 Introduction**

This section of the document contains detailed suggestions for initiatives in Coon to protect and enhance biodiversity. Ideally consideration of these initiatives should be informed by knowledge of the current systems used to manage biodiversity which are explained in Appendix 3.

### **2.2 Biodiversity SWOT**

#### **Strengths**

Coon contains a biodiversity area of international importance protected by the Habitats Directive. While habitats listed as qualifying interests in the SAC are not present in Coon, various types of wetland habitats are present such as Riparian Woodland (WN5), Wet Grasslands (GS4) as well as Eroding Rivers (FW1). The plant checklist confirms that some plant species associated with the river and wetlands and which are listed in the SAC site synopsis are also present in Coon including Water starwort sp, Crowfoot sp, Rusty Willow, Iris, Wild Angelica, Meadowsweet, Purple Loosestrife and Common Valerian. Species associated with the woodlands in the SAC are also found in Coon including Holly, Hazel, Downy birch, Ash, Great wood rush, Broad buckler fern and Hard fern.

The freshwater assessment has confirmed that water quality is good. Throughout most of its length the river is fenced off from cattle which protects its banks from damage.

The area supports a good example of a native type woodland on a steep hill south of the village.

The garden centre is unique in encouraging a focus on planting for biodiversity.

There is expertise on biodiversity locally (freshwater quality assessment) and the Tidy Towns committee has worked consistently to implement landscaping for biodiversity in the locality, including the establishment of a native type woodland beside the river.

The area has bird species of particular interest including the red listed Swift and other Amber listed birds. Plant species of interest are Round leaved crowfoot and Early Purple Orchid.

The BAP now provides the community with details of their biodiversity which can act as a baseline for future monitoring, as a resource for local education or/and a starting point for further research.



### **Weaknesses**

Weaknesses of biodiversity and management in Coon are

Lack of relationship with the NPWS, the statutory agency responsible for designating and managing SAC's. As a result the community does not have easy access to expertise on biodiversity management and no information has been available about the SAC in this locality. This weakness may be addressed in the short term as NPWS has received extra resources.

### **Opportunities**

There are many opportunities to protect and enhance biodiversity involving local environmental education (formal and informal) building on the work carried out by the Tidy Towns in the local National School, projects in various locations around the village to demonstrate best practise and the promotion of events which will support community cohesion while taking care of biodiversity. Table 4 lists recommended actions.

The principal priority for action is the protection and promotion of the area of international biodiversity importance.

### **Threats**

Threats to biodiversity come from a lack of awareness of the value of native species and semi-natural habitats, planning policies which allow for the removal of hedgerows without ensuring that a similar habitat is produced.

Specific threats are the practises of adding non-natives to local hedgerows and concreting drainage ditches. This issue is not unique to Coon. Suburbanisation of hedgerows originally planted by farmers to serve a farming purpose occurs regularly associated with the construction of one off housing. Concreting drainage ditches allows for more speedy movement of water and is a common practise also.

Ash die back disease, present throughout Ireland can be seen to threaten these trees in Coon.

## 2.3 BAP Actions

**Table 4 Actions to protect and improve biodiversity in Coon** (Note, in column ‘Urgency’, 1 in the scale signifies low urgency and 3 is high urgency)

No	General objective	Habitats Affected	Recommended Actions	Whose responsibility? Key group Underlined	Urgency (on Scale of 1-3)
1	Improve awareness of biodiversity	All	<p>Promote awareness of important biodiversity associated with SAC, linkages between it and private land through drainage ditches and hedgerows.</p> <p>Engage Primary School. See Appendix 3 for guidelines.</p> <p>Continue to promote biodiversity friendly gardening and sustainable practices with an emphasis on composting, re-using water and non-use of peat based composts.</p> <p>Publicise results of expert studies carried out for the BAP.</p> <p>Organise an annual fun event to promote biodiversity such as “Balsam bashing”</p> <p>Encourage community to feed birds every winter.</p> <p>Promote engagement with monitoring projects described in Appendix 3</p>	<p>Farm organisations</p> <p>Primary School Principal</p> <p>Residents Associations</p> <p><u>Tidy Towns Committee</u></p> <p>Heritage Officer Kilkenny County Council.</p>	3

No	General objective	Habitats Affected	Recommended Actions	Whose responsibility? Key group Underlined	Urgency (on Scale of 1-3)
2	Carry out survey about awareness of biodiversity		See survey developed for Leitrim by local group <a href="https://forms.gle/pkHmcGjIw3h56">forms.gle/pkHmcGjIw3h56</a>	<u>Tidy Towns Committee</u>  Primary school	2
3	Encourage further research		Check annually for Swift. Carry out bat surveys and lichen surveys. Add drainage ditches (FW4) to habitat map.	<u>Coon Tidy Towns and Heritage Group</u>  Householders  Farmers with drainage ditches  <u>Norevision</u>  <u>Heritage Officer, Kilkenny County Council</u>	2
4	Promote awareness of good hedgerow management	WL1	Organise field-based event to demonstrate hedgerow characteristics which are beneficial for biodiversity.  Obtain webinar on hedgerows developed for Ballymun and Phibsboro Tidy Towns and circulate link to local farmers and householders.	<u>Coon Tidy Towns and Heritage Group</u>  Hedge Laying Association of Ireland  Irish Wildlife Trust	3

No	General objective	Habitats Affected	Recommended Actions	Whose responsibility? Key group Underlined	Urgency (on Scale of 1-3)
				BirdWatch Ireland Kilkenny Branch  Ballymun and Phibsboro Tidy Towns	
5	Develop relationship with Norevision		As this local initiative has huge potential for local training and networking establish and maintain a good relationship with Chairman and project workers. Deliver all results of BAP to this project. Invite to launch.	<u>Coon Tidy Towns and Heritage Group</u>  Norevision	3
6	Manage invasive Himalayan Balsam	WS1 GS2	Carry out invasive species survey to confirm precise locations. Eradicate and control through a regular fun “balsam bashing” event	<u>Coon Tidy Towns and Heritage Group</u>  Heritage Officer	2
7	Obtain equipment and resources to enable community and local school to learn about biodiversity	All	See list in Appendix 3	<u>Coon Tidy Towns and Heritage Group</u>  Primary school	3

No	General objective	Habitats Affected	Recommended Actions	Whose responsibility? Key group Underlined	Urgency (on Scale of 1-3)
8	Put up nest boxes for Swifts and other bird species		<p>Nestboxes for Swifts should be particularly encouraged as they now lack suitable nesting sites within buildings, due to changing building regulations regarding design e.g. lack of crevices under house eaves.</p> <p>Different bird species require different types of nest boxes. Spotted Flycatcher and Robin favour nest boxes with an open front.</p>	<p><u>Householders</u></p> <p>Coon Tidy Towns and Heritage Group</p> <p>BirdWatch</p> <p>Kilkenny Branch</p>	<p>3</p> <p>Action for Swifts</p> <p>2</p>
9	Develop good relationship with landowner of WD1 woodland shown on 1 <sup>st</sup> ed OS map		<p>Inform them about Native Woodland Scheme which offers advice and financial support for management to enhance biodiversity</p>	<p><u>Coon Tidy Towns and Heritage Group</u></p> <p>Landowner</p> <p>Forest Service</p>	3
10	Develop good relationships with relevant statutory agencies and NGO's		<p>Examine Appendix 3 for information about statutory and non-statutory organizations local and national concerned with biodiversity which could support initiatives in Coon. Select an NGO which has local activists.</p>	<p><u>Coon Tidy Towns and Heritage Group</u></p>	3

No	General objective	Habitats Affected	Recommended Actions	Whose responsibility? Key group Underlined	Urgency (on Scale of 1-3)
11	Landscape areas to improve biodiversity such as area in front of community centre	GA2 BL3	<p>Plant stonewall with wall shrubs/climbers such as Pyracantha, Chaenomeles species or ivy (common ivy <i>Hedera helix</i> and /or Persian ivy <i>Hedera colchia</i>), Honeysuckle (<i>Lonicera periclymenum</i>), trumpet honeysuckle (<i>Campsis radicans</i>) or Clematis</p> <p>Along by metal fence – plant a native hedge – include native roses such as Field rose, <i>Rosa arvensis</i>, Dog rose, <i>Rosa canina</i>, common holly, hazel and sloe.</p> <p>Plant some of the smaller native trees or closely related garden varieties in an informal pattern in the vicinity of the fence or in grassed areas – hawthorn, crab, mountain ash, bird cherry, wild cherry, silver birch, strawberry tree (<i>Arbutus unedo</i>) and spindle.</p> <p>Some of the grassy areas could be left to grow as a wildflower meadow.</p> <p>Include other suitable small trees such as Juneberry tree – Amelanchiers</p>	<p><u>Coon Tidy Towns and Heritage Group</u></p> <p><u>Volunteers</u></p> <p>Heritage Officer and Environmental Awareness Officers, Kilkenny County Council</p> <p>ESB</p> <p>Landowners</p> <p>Parish Council</p>	2
12	Landscape areas to improve biodiversity such as environs		<p>First paint the building a grey colour. Plant the wall with climbing hydrangea <i>Hydrangea petiolaris</i>. Plant site with some small native trees silver birch or hawthorn at 2 to 4 or 5 m spacing – vary it so it looks informal and natural . Underplant with any of the following: native ferns such as soft shield fern,</p>	<p><u>Coon Tidy Towns and Heritage Group</u></p>	2

No	General objective	Habitats Affected	Recommended Actions	Whose responsibility? Key group Underlined	Urgency (on Scale of 1-3)
	of EIR substation		<p>buckler ferns, lady fern, hard ferns, native foxgloves, wood sage, tutsan (<i>Hypericum androsaemum</i>), common primroses, dog violets, creeping jenny, ajuga, wood anemone, wood sorrel, golden rod (<i>Solidago virgaurea</i>) and native bluebells.</p> <p>Include some of the following species.</p> <p>Japanese anemone (<i>Anemone × hybrida</i>) in partial shade, winter and spring flowering crocus, snowdrops, Christmas rose (<i>Helleborus niger</i>), sweet box <i>Sarcococca confusa</i> and <i>S. hookeriana</i> low evergreen growing shrubs 3- 5 enough in total; Elephant ear (<i>Bergenia</i> species), lungwort (<i>Pulmonaria</i> sp.) , columbine (<i>Aquilegia</i> sp.), Stinking iris, <i>Iris foetidissima</i>, Winter aconites, <i>Eranthis hyemalis</i>, bellflower, <i>Campanula lactiflora</i>, hardy geraniums including <i>G. Roseanne</i> and <i>Geranium phaeum 'Raven'</i></p>	EIR	
13	Rejuvenate select areas to enhance biodiversity such as landscaping in bed at car park with sign		<p>Put the Na Caith Bruscar sign at the side.</p> <p>Prune lilac as a tree removing some of the lower branches, opening up space to plant under it with some pollinator friendly plants. Remove Photina. First prune it back and then replant it somewhere it can realize its full size and flower. Berberis needs at least 2 m to itself .<i>Sarcococca humilis</i> or <i>S. confusa</i> could replace the Photinina as they are evergreen, have scented flowers so will be valuable to pollnators in winter.</p>	<p><u>Coon Tidy Towns and Heritage Group</u></p> <p>Willing volunteers</p>	2

No	General objective	Habitats Affected	Recommended Actions	Whose responsibility? Key group Underlined	Urgency (on Scale of 1-3)
	<i>Na caith bruscar</i>		<p>Underplant the lilac with Japanese anemone (<i>Anemone × hybrida</i>), Elephant ear (<i>Bergenia</i> species), lungwort (<i>Pulmonaria</i> sp.) in shady spots, columbine (<i>Aquilegia</i> sp.), Alstroemeria species, Geum species and foxgloves in partial shade, snapdragons, <i>Armeria maritima</i> near edge with good light. Rudbeckia species prefer full sun but will tolerate some shade. Another good plant is the iceplant <i>Sedum spectabile</i> and Michaelmas daisies as they will flower well into October.</p> <p>Plant some tumbling plants such as Aubrieta, campanulas, to fall over the edge of the planter and break up the walls.</p>		
14	Improve landscaping at site 1 of Coon Stone ( <i>with bug hotel</i> )		This bed with the coon stone is good for biodiversity. Its impact would be improved if its edge was better defined to stop grass growing into it and a small tree was planted behind the stone – a wild cherry <i>Prunus avium</i> or a snowy mespil <i>Amelanchier x grandiflora</i> 'Robin Hill' grown on single stem, or a mountain ash.	<p><u>Coon Tidy Towns and Heritage Group</u></p> <p>Willing volunteers</p>	2
15	Improve landscaping at site 2 of Coon Stone (with sign		Extend the bed along the length of the wall and widen it slightly, space out the existing plants which are cramped. Include some of the following - Alstroemeria species – will flower all summer, Echinacea to the back, Rudbeckias, <i>Persicaria amplexicaulis</i> , <i>Scabiosa</i> spp. Scabious, <i>Veronica spicata</i> speedwell.	<p><u>Coon Tidy Towns and Heritage Group</u></p> <p>Willing volunteers</p>	2



No	General objective	Habitats Affected	Recommended Actions	Whose responsibility? Key group Underlined	Urgency (on Scale of 1-3)
	<i>Mind Our Children</i> )		<p>As some height would be good if bed extended, plant a pink hawthorn tree or a mountain ash but not in the middle – offset it and plant in a wider part of the bed. Underplant with wild primroses, lung wort, bugle, violets, crocus, Colchicum species autumn crocus, foxglove, geums and hellebores.</p> <p>Plant wall with honey honeysuckle or ivy.</p>		
16	Rejuvenate landscaping in long narrow bed opposite bed with <i>Na caith bruscar</i> signs	BC4	<p>Thin out plants draping over wall and plant some perennials such as aubrieta, <i>Yellow alyssum Aurinia saxatilis</i> between them. Remove some from inside the bed; leave <i>Cotoneaster horizontalis</i> at the wall. As the Photinia Red Robin and spiraea gold are poor, remove them, the grass is barely visible underneath it and is damaged in places. Prune the lilac. Plant 3 or so silver birch in this bed, make the spacing between each one a bit different and do not plant them in a row. Plant more Boston ivy along the wall.</p> <p>Plant lavender away from the trees. Under plant the birch with bluebells, crocus, snowdrops, winter aconites – these can be planted throughout the bed as well camassia's and the wild daffodil <i>Narcissus pseudonarcissus</i></p> <p>Include some alstromerias, rudbeckias and Michaelmas daisies.</p>	<p><u>Coon Tidy Towns and Heritage Group</u></p> <p>Willing volunteers</p>	2

No	General objective	Habitats Affected	Recommended Actions	Whose responsibility? Key group Underlined	Urgency (on Scale of 1-3)
17	Improve Peace Garden as an amenity and for biodiversity		<p>Renew the peace and reconciliation sign. Plant more virginia creeper or ivy on the inside of the wall to increase habitat for pollinators and birds. Clear the ground of weeds and plant a small grove of mountain ash (rowan), 5 or 7 or more trees –on the far side of the hedge or in one or two of the opened gaps –in a naturalistic fashion. Plant some wild woodland plants and a few garden ones – see list from EIR station. Put down fresh bark or re do the surface with a ‘dust finish’.</p> <p>Level an area to provide a good view of the river. Make a ramp or some steps down towards the river. The vegetation could be left as it is but cut back in autumn and the cut material removed to prevent leaching into the river.</p>	<p><u>Coon Tidy Towns and Heritage Group</u></p> <p>Willing volunteers</p>	3

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Habitat GS4

Coon

## Appendix 1 Account of the Barrow Nore SAC Site Code: 002162 from NPWS.ie

### Relevant information highlighted in red

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 Durrrow. 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
- [1170] Reefs
- [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, *Palustriella commutata* 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 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 (*Orobancha 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 Carrickloney, 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*. An extensive area of honey-comb worm biogenic reef occurs adjacent to Duncannon, Co. Wexford on the eastern shore of the estuary. It is formed by the polychaete worm *Sabellaria alveolata*. This intertidal *Sabellaria alveolata* reef is formed as a sheet of interlocking tubes over a considerable area of exposed bedrock. This polychaete species constructs tubes, composed of aggregated sand grains, in tightly packed masses with a distinctive honeycomb-like appearance. These can be up to 25cm proud of the substrate and form hummocks, sheets or more massive formations. A range of species are reported from these reefs including: *Enteromorpha* sp.; *Ulva* sp.; *Fucus vesiculosus*; *Fucus serratus*; *Polysiphonia* sp.; *Chondrus crispus*; *Palmaria palmate*; *Coralinus officinalis*; *Nemertea* sp.; *Actinia equine*; *Patella vulgate*; *Littorina littorea*; *Littorina obtusata* and *Mytilus edulis*.

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, 2015. 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 10 km stretch of the Nore, add further interest to this site

## Appendix 2 Checklist of plants 2021 (identified in the study area 2019-2021)

English name	Latin name	Status N= Native NN= Non native	Presence in Hedgerows (from a sample of 13)
Alder	<i>Alnus glutinosa</i>	N	
Angelica	<i>Angelica sylvestris</i>	N	1
Apple	<i>Malus sp</i>	NN	3
Ash	<i>Fraxinus excelsior</i>	N	11
Aspen	<i>Populus tremula</i>	N	1
Barren strawberry	<i>Potentilla sterilis</i>	N	
Beech	<i>Fagus sylvatica</i>	NN	
Bilberry	<i>Vaccinium myrtillus</i>	N	
Bindweed	<i>Calystegia sepium</i>	N	2
Birds foot trefoil	<i>Lotus corniculatus</i>	N	1
Blackthorn	<i>Prunus spinosa</i>	N	7
Bluebell	<i>Hyacinthoides non-scriptus</i>	N	
Bog stitchwort	<i>Stellaria alsine</i>	N	
Bracken	<i>Pteridium aquilinum</i>	N	1
Bramble	<i>Rubus fruticosus agg</i>	N	8
Broad buckler fern	<i>Dryopteris dilatate</i>	N	
Broad leaved dock	<i>Rumex obtusifolius</i>	N	4
Broadleaved plantain	<i>Plantago major</i>	N	1
Brooklime	<i>Veronica beccabunga</i>	N	
Bugle	<i>Ajuga reptans</i>	N	

English name	Latin name	Status N= Native NN= Non native	Presence in Hedgerows (from a sample of 13)
Burr-reed	Sparganium sp	N	
Bush vetch	Vicia sepium	N	10
Cat's Ear	Hypericum radicata	N	
Cat's Ear	Hypochaeris radicata	N	
Charlock	Sinapis arvensis	NN	1
Cock's foot	Dactylis glomerata	N	5
Coltsfoot	Tussilago farfara	N	
Common chickweed	Stellaria media	N	1
Common figwort	Scrophularia nodosa	N	1
Common gorse	Ulex europaeus	N	2
Common marsh-bedstraw	Galium palustre	N	
Common Mouse-ear	Cerastium fontanum	N	1
Common poppy	Papaver rhoes	N	
Common silver birch	Betula pendula	N	
Common sorrel	Rumex acetosa	N	5
Common velerian	Valeriana officinalis	N	
Common vetch	Vicia sativa	N	1
Common Yarrow	Achillea millefolium	N	
Couch grass	Elymus repens	N	

English name	Latin name	Status N= Native NN= Non native	Presence in Hedgerows (from a sample of 13)
Cow parsley	<i>Anthriscus sylvestris</i>	N	7
Creeping bentgrass	<i>Agrostis stolonifera</i>	N	2
Creeping buttercup	<i>Ranunculus repens</i>	N	7
Creeping cinquefoil	<i>Potentilla reptans</i>	N	2
Creeping soft grass	<i>Holcus mollis</i>	N	5
Creeping thistle	<i>Cirsium arvense</i>	N	3
Crested dog's tail	<i>Cynosurus cristatus</i>	N	1
Cuckooflower	<i>Cardamine pratensis</i>	N	
Cut-leaved crane's bill	<i>Geranium dissectum</i>	N	1
Daisy	<i>Bellis perennis</i>	N	1
Dandelion	<i>Taraxacum officinale</i>	N	5
Dogwood	<i>Cornus sp.</i>	NN	
Dove's-foot crane's bill	<i>Geranium molle</i>	N	
Eared willow	<i>Salix aurita</i>	N	
Early-purple orchid	<i>Orchis mascula</i>	N	
Elder	<i>Sambucus nigra</i>	N	4
English elm	<i>Ulmus procera</i>	NN	1
False Oat-grass	<i>Arrhenatherium elatius</i>	N	8
Field forget me not	<i>Mysotis arvensis</i>	N	

English name	Latin name	Status N= Native NN= Non native	Presence in Hedgerows (from a sample of 13)
Field Horsetail	<i>Equisetum arvense</i>	N	3
Field rose	<i>Rosa arvensis</i>	N	11
Flote grass	<i>Glyceria</i> sp.	N	
Fool's-water-cress	<i>Apium nodiflorum</i>	N	
Foxglove	<i>Digitalis purpurea</i>	N	3
Fumitory	<i>Fumaria officinalis</i>	N	
Garden honeysuckle	<i>Lonicera nitida</i>	NN	1
Germander speedwell	<i>Veronica chamaedrys</i>	N	5
Goat willow	<i>Salix caprea</i>	N	
Golden Saxifrage	<i>Chrysosplenium oppositifolium</i>	N	
Great willowherb	<i>Epilobium hirsutum</i>	N	
Great Wood-Rush	<i>Luzula sylvatica</i>	N	1
Greater stitchwort	<i>Stellaria holostea</i>	N	
Grey willow	<i>Salix cinerea</i>	N	4
Ground ivy	<i>Glechoma hederaceae</i>	N	
Groundsel	<i>Senecio vulgaris</i>	N	
Hairy bird's foot trefoil	<i>Lotus uliginosus</i>	N	
Hairy bitter-cress	<i>Cardamine flexuosa</i>	N	
Hard fern	<i>Blechnum spicant</i>	N	

English name	Latin name	Status N= Native NN= Non native	Presence in Hedgerows (from a sample of 13)
Hard rush	<i>Juncus inflexus</i>	N	1
Hard shield-fern	<i>Polystichum aculeatum</i>	N	1
Hart's tongue fern	<i>Asplenium scolopendrium</i>	N	3
Hawthorn	<i>Crataegus monogyna</i>	N	13
Hazel	<i>Corylus avellana</i>	N	1
Heath speedwell	<i>Veronica officinalis</i>	N	
Hebe	<i>Hebe</i> sp.	NN	
Hedge woundwort	<i>Stachys sylvatica</i>	N	1
Herb Robert	<i>Geranium robertianum</i>	N	3
Heuchera		NN	
Himalayan birch	<i>Betula utilis jacquemonti</i>	NN	
Hoary willow herb	<i>Epilobium parviflorum</i>	N	1
Hogweed	<i>Heracleum sphondylium</i>	N	2
Holly	<i>Ilex aquifolium</i>	N	2
Holly	<i>Ilex aquifolium</i>	N	4
Honeysuckle	<i>Lonicera periclymenum</i>	N	4
Himalayan balsam	<i>Impatiens glandulifera</i>	NN	1
Ivy	<i>Hedera helix</i>	N	11
Jointed rush	<i>Juncus articulatus</i>	N	
Knapweed	<i>Centaurea nigra</i>	N	

English name	Latin name	Status N= Native NN= Non native	Presence in Hedgerows (from a sample of 13)
Lady fern	Athyrium filix-femina	N	
Lady's mantle	Alchemilla mollis	N	
Lesser celandine	Ranunculus ficaria	N	
Lesser stitchwort	Stellaria graminea	N	3
Lords and Ladies	Arum maculatum	N	
Maiden hair spleenwort	Asplenium trichomanes	N	1
Male fern	Dryopteris filix-mas	N	7
Marsh ragwort	Senecio aquaticus	N	
Marsh woundwort	Stachys palustris	N	
Meadow buttercup	Ranunculus acris	N	3
Meadow buttercup	Ranunculus acris	N	2
Meadow grass	Poa sp.	N	
Meadow thistle	Cirsium dissectum	N	1
Meadow vetchling	Lathyrus pratensis	N	3
Meadowsweet	Filipendula ulmaria	N	7
Narrow ribbed plantain	Plantago lanceolata	N	1
Nettle	Urtica dioica	N	13



English name	Latin name	Status N= Native NN= Non native	Presence in Hedgerows (from a sample of 13)
Nipplewort	Lapsana communis	N	7
Oak	Quercus robur	N	
Osier	Salix viminalis	NN	
Ox eye daisy	Leucanthemum vulgare	N	2
Pale willowherb	Epilobium roseum	NN?	
Pignut	Conopodium majus	N	
Pineapple- Weed	Matricaria discoidea	NN	1
Polypody fern	Polypodium vulgare	N	2
Potato	Solanum tuberosum	NN	1
Primrose	Primula vulgaris	N	1
Ragwort	Senecio jacobaea	N	1
Red clover	Trifolium pratense	N	
Red fescue	Festuca rubra	N	3
Redshank	Polygonum persicaria	N	
Robin run the hedge	Galium aparine	N	1
Rose-of Shannon	Hypericum calycinum	NN	
Rosebay Willowherb	Chamaenerion angustifolium	N	1
Rough Horsetail	Equisetum hymenale	N	
Round leaved crowfoot	Ranunculus omiophyllus	N	
Rowan	Sorbus aucuparia	N	

English name	Latin name	Status N= Native NN= Non native	Presence in Hedgerows (from a sample of 13)
Rusty back fern	Asplenium ceterach	N	
Rye grass	Lolium perenne	N	
Scaly male fern	Dryopteris affinis	N	2
Sharp flowered rush	Juncus sp. possibly acutiflorus	N	
Shore Horsetail	Equisetum fluviatile	N	
Silverweed	Potentilla anserina	N	2
Slender false brome	Brachypodium sylvaticum	N	
Slender St John's Wort	Hypericum pulchrum	N	
Soft rush	Juncus effusus	N	2
Soft shield fern	Polystichum setiferum	N	5
Sow thistle	Sonchus olearaceus	N	2
Spear thistle	Cirsium vulgare	N	6
Square-stalked St John's Wort	Hypericum tetrapetrum	N	1
St John's Wort	Hypericum maculatum	N	
Sweet vernal grass	Anthoxanthum odoratum	N	2
Sycamore	Acer pseudoplatanus	NN	3
Timothy	Phleum pratense	N	1
Tormentil	Potentilla erecta	N	2
Tufted hair-grass	Deschampsia caespitosa	N	1
Tufted vetch	Vicia cracca	N	
Tutsan	Hypericum androsaemum	N	1

English name	Latin name	Status N= Native NN= Non native	Presence in Hedgerows (from a sample of 13)
Upright hedge -parsley	Torilis japonica	N	6
Water cress	Nasturtium officinale	N	
Water mint	Mentha aquatica	N	
Weeping willow	Salix babylonica	NN	
White clover	Trifolium repens	N	4
Whitebeam	Sorbus aria	NN	
Wild privet	Ligustrum sp.	N	1
Wild strawberry	Fragaria vesca	N	
Winter-cress	Barbarea vulgaris	N	
Wood anemone	Anemone nemorosa	N	2
Wood avens	Geum urbanum	N	3
Wood dock	Rumex sanguineus	N	1
Wood sorrel	Oxalis acetosella	N	
Wych elm	Ulmus glabra	N	1
Yellow iris	Iris pseudacorus	N	

## Appendix 3 Biodiversity Management: Background information and general guidelines

*Where is a good place for biodiversity?*

*Legal protection for areas and species*

*Habitats and how to develop them (woodlands, shrubberies and wetlands)*

*Gardening for biodiversity*

*Artificial habitats for birds, bats and insects*

*Support for community based initiatives*

*Financial support for community based initiatives*

*Developing a partnership with the local primary school*

*Resources needed to support local learning about biodiversity*

### Where is a good place for biodiversity?

As biodiversity is much reduced due to development the best places will be where little has occurred. Therefore a good place for biodiversity will not be covered in houses, roads or subject to drainage. It will not be covered by plants established by people but by vegetation which has been there for hundreds or thousands of years. This vegetation will principally consist of native plant species.

Native is broadly speaking a species which arrived naturally into the country in comparison to a species which has been introduced deliberately by people. Native plant and animal species are more valuable for biodiversity as they are more likely to be important as a source of food or shelter for other species. Native species are more likely to be living in their optimum location so their presence reveals information about the local environment which helps to characterize other aspects of local biodiversity.

There is a place for non-natives too as many have been *naturalised*, firmly established and can also be important for other species. There is particular concern with non-natives which have become *invasive* affecting natural habitats and other native species. The government has published lists of these which include Rhododendron in woodlands and Himalayan Balsam usually in rivers. People who have these species on their land must take care not to allow it spread, or they will be prosecuted.

A good place for native biodiversity will be a non-intensively managed field, a thick hedgerow, a drainage ditch, any type of wetland; areas covered in scrub or woodland or even rough grassland near a road. In these areas you will find the last remaining

reservoirs of your local biodiversity. The habitat map shows where these features are found. In general the age of these habitats will be a good guide to their value.

If you do not have a habitat map and you want to find out if you have any ancient habitats in your locality check the first edition of the Ordnance Survey maps on the Ordnance Survey website (<https://osi.ie>). Click on map viewer on the home page.

## **Legal protection for areas and species?**

The status of a plant and animal affects the protection given to it by legislation. Our wildlife legislation provides protection for specific large native plants, all large native animals and all native breeding birds which are rare and vulnerable to disturbance. Rabbit is not given any protection under the Wildlife Acts as it is not a native species (they arrived with the Normans). Because these species listed in the Wildlife Act are protected it is necessary to get a license from the NPWS to disturb them. However derogations have also been agreed. All teachers are allowed take tadpoles from the wild bring them into schools. Of particular relevance to farmers and gardeners is the prohibition on hedge cutting between 1<sup>st</sup> March and 1<sup>st</sup> September to protect nesting birds. Tree cutting is not regulated by legislation concerned with biodiversity but with forestry. According to these regulations there is no need to get a license to fell trees in an urban area.

To find out about areas which have been officially recognized as being of biodiversity value in your locality go into the website for the National Biodiversity Data Centre (<https://maps.biodiversityireland.ie>). Click on maps on the home page to move to the map of Ireland. As this principally shows physical features, topography and rivers so you might need some help from other maps to check your location. Once you have zoomed into your location of interest there are lots of options. If you want to know about internationally important areas of biodiversity interest value then click on Protected Areas. SAC's (Special areas of Conservation) and SPA's (Special Protected Areas).

The other category NHA's are sites of national biodiversity importance protected under the Irish Wildlife Acts. The boundaries of all these areas will be shown on your map. Click anywhere on this shading to find its official name and code number. Take particular note of the number.

To get information about the protected area (if an internationally important site or designated Natural Heritage Area) go into the NPWS website (<https://www.npws.ie/maps-and-data>). Click for *details* in box titled *Protected Sites Data*. Go to *search* page in section of page titled *Search for Site Documents*. In box beside *code* enter number (obtained from the map) and click. This will bring up a set of documents prepared by the NPWS about each Natura site (SAC and SPA) and designated NHA's (not all NHA's, only designated ones). The most useful doc for Natura sites is the category titled *Site Synopsis*. It provides very specific (and sometimes technical) information about the types of important areas (habitats) and species found throughout the site and in areas of particular importance. As a result of

the Habitats and Birds Directives all statutory agencies are obliged to protect these habitats and species and thus any work affecting the areas designated as SAC's and their surrounds must be informed by an ecological assessment called Appropriate Assessment.

Very few of these sites have Management Plans and thus there is little or no information about the biodiversity value of all the land within an SAC. NPWS have not had the resources to prepare these plans and fieldwork is needed to determine their value. Occasionally they have been prompted to prepare them due to local interest or pressure from environmental organisations. If an area has not been designated by the authorities its biodiversity value can be inferred if it contains rare habitats or species. Rarity can be assessed at various scales. Various reports can be examined to give an indication of the rarity and importance of species. BirdWatch Ireland regularly produces list of birds of conservation concern. National floras usually provide an indication of the rarity of plant species. County floras provide similar valuable information at a county scale. *Red lists* (following convention drawn up by an international conservation organisation) have been produced for plants, bryophytes, mammals, amphibians, reptiles and freshwater fish, and various groups of invertebrates including bees, stoneflies, damselflies and dragonflies, butterflies, macro moths, cartilaginous fish, water beetles, mayflies and non-marine mollusca. Red lists have been drawn up by national experts and highlight species of particular importance. The presence of certain birds and other listed species is important in identifying areas of biodiversity value. Local naturalists may also have such information. Anglers groups are particularly valuable sources of information on water quality and fish.

## **Habitats and how to develop them**

Homes for biodiversity are called habitats. The habitat map for your locality reveals the nature of the current habitats. To obtain more information about habitats examine the publication produced by the Heritage Council. This can be accessed here (<https://www.npws.ie/sites/default/files/publications/pdf/A%20Guide%20to%20Habitats%20in%20Ireland%20-%20Fossitt.pdf>). You need technical knowledge to fully comprehend the distinctions at level 3 but not at levels 1 and 2 as their definition can be easily understood.

### **Woodlands and hedgerows**

The most useful terrestrial habitat for biodiversity is a native (WN type) woodland. Information in your biodiversity action plan should suggest the original type of woodland present and provide details of where traces may be present in your locality. Biodiversity management should focus on improving the quality of existing woodlands. If a native woodland is not present or a type of woodland from which it can be converted a native woodland can be established. Guidance provided by the governments Native Woodland Scheme indicates the relevant species for your soil type (<https://www.teagasc.ie/crops/forestry/grants/establishment-grants/native-woodland-establishment/>). Generous grants are available for this work for sites as

small as 0.1ha. Soil type can be discovered in the soil map produced by An Foras Taluntais . A native woodland would support a variety of native trees and shrubs typical of the chosen woodland type. The larger the size of woodland the better but even mini- woodlands so called pocket forests (size between a car parking space and tennis court) can produce great benefits for biodiversity (see [pocketforests.ie](http://pocketforests.ie) for details of this initiative). Ideally a new woodland should be within hopping distance of an existing hedgerow or shrubby area. The shape should allow for maximum edges as birds and insects will use the margins for feeding or sheltering. Sunny edges will be particularly valuable for insects and pollinators.

### **Shrubberies**

Shrubberies can be very valuable for nesting birds if they produce food for pollinators and safe nesting places for birds at chest height. They can be any shape or size. A hedgerow is essentially a specialised linear shrubbery with an A shaped structure involving trees, shrubs, possibly a bank and ditch. Original hedgerows were stock proof therefore they were very good for nesting birds. As hedgerow management is no longer practiced it is rare to find a tall A shaped hedgerow. As a replacement for a hedgerow a shrubbery should be managed to retain their compact shape and bushiness. Ideally a new hedgerow should be within hopping distance of an existing hedgerow or shrubby area.

### **Grasslands to improve their biodiversity value**

The potential of grasslands is indicated in your Level 3 habitat map. Grasslands identified as GS type have good potential. Grasslands of type GA have less potential. It is possible to improve all grasslands (even GA type) to make them more like a wildflower meadow following a long-term management regime (10-20 years). This involves cutting twice/year (March/April and September) and removing all cuttings. This will eventually reduce the fertility of the soil to encourage growth of wildflowers i.e. forbs as opposed to grasses. This is the most environmentally friendly way to create a wildflower meadow, manage a GS grassland and to convert a grassland of low potential GA type to a GS type.

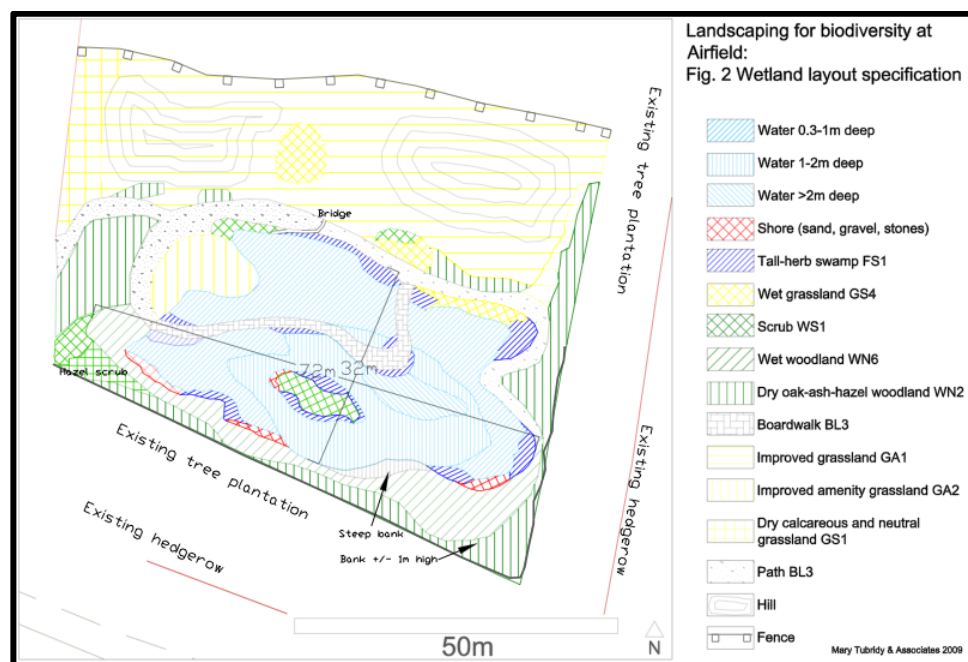
Ideally in all grassland areas the policy should be to restrict mowing until the end of the flowering season to benefit pollinators. Putting up the All Ireland Pollinator sign will let the public know why the grass is not being cut.

If you want an instant wildflower meadow spread seeds but the resulting grassland should be called a “pictorial meadow”. There are lots of issues about the current practice of establishing so called “wildflower meadows”. Pictorial meadows will be good for pollinators and butterflies but will require major management each year to maintain its interest. If you use wildflower seed from a packet there is also a strong risk of introducing non-natives or plants which became extinct in Ireland. Best to collect seed locally for use in establishing these types of habitats.

### **Wetlands**

A wetland is also a very valuable habitat to establish as these have almost always been removed and they can support a wide range of flora and fauna. While ideally it should

be a pond (and a large one) it could even be a birdbath which has shallow edges to allow birds drink from it. Any pond or wetland should be fed by good quality water. The hydrological regime should allow for constant/ intermittent water flow (never stagnant water). Its construction should provide for a mixture of open water 70% and surrounding vegetation 30%, an undulating profile (to maximise edge effects), and some steep and some shallow margins. A plan for a new wetland developed by Mary Tubridy and Betsy Hickey which incorporates these characteristics is shown below.



In developing wetlands particular care is needed to prevent invasive plants or animals colonizing the pond. Resources should be available for management as wetlands are dynamic systems and artificial wetlands may silt up or suffer from changes to local hydrology.

## Gardening for biodiversity

The activity of gardening for food or amenity offers great opportunities to learn about biodiversity as it demonstrates the linkages between soil, plants, animals and people. This potential is greatest following organic growing principles and establishing native species. Composting and seed saving will demonstrate the circular economy and food production will demonstrate the importance of the plant world to the survival of humanity.

If you want to benefit biodiversity then the obvious thing to do is to plant native trees, shrubs or herbs or a plant listed in the All Ireland Pollinator plan (pollinators.ie). If you do not find a native species to your taste plant a *variety* of a native species or a species that belongs to the *same genus*. The genus is the surname of the species. If the common wild Daisy is called *Bellis perennis* (Latin names are always in Italics). *Bellis* is the genus and *Bellis perennis* is the species within that genus. So if you do not want to



plant *Bellis perennis*, look for other plants whose name starts with *Bellis*. Because they belong to the same genus it is likely that pollinators etc. will utilize them.

Varieties are cultivated types of wild species (similar to breeds of dogs). Many wild plants are now available as varieties which are showier than the original. They are worth planting too. The species name will be provided followed by the *var* name.

Therefore if you plant a native tree typical of the local environment it will flower (good for pollinators), produce seeds (food for birds), branches (good for roosting birds) and eventually once it matures, has cracks in its trunk and is covered in ivy it will be a home for roosting bats and nesting birds. Remember few songbirds nest in trees.

While planting natives is the best strategy, non-natives can also be used if they can perform one of these functions. All clematis are good for birds, cultivars of *Clematis tangutica*, also provides nectar and pollen for bees, followed by wispy seedheads in autumn, birds will take the material to use in their nests in spring; climbing hydrangea, single, open flowered climbing and rambling roses, provide nectar and pollen for pollinators, followed by hips for birds. The worst species is *Leylandii*. Under no circumstance should this be planted.

Here are suggestions for perennials in flowerbeds, hanging baskets and containers:

- Hanging baskets should always be near buildings.
- Pin cushion scabious *Knautia arvensis* and cultivars
- Oregano - *Origanum vulgare* 'Aureum'
- Thyme – lemon scented thyme *Thymus citriodorus aureus*
- Aubrieta cascade
- Trailing bellflower *Campanula poscharskyana*
- *Aurinia saxatilis*
- Alpine rock cress *Arabis alpina subsp. Caucasic*
- Tussock bellflower *Campanula carpatica*
- Suggestions for annuals in flower beds and containers.
- Bidens
- Bacopa
- Diascia
- Heliotrope
- Lobelia 'pendula'
- Million bells *Calibrachoa*
- Floss flower *Ageratum houstonianum*
- Snapdragon *Antirrhinum majus*
- China aster *Callistephus chinensis*
- Baby blue eyes *Nemophila menziesii*

## **Artificial habitats for birds, bats and insects**

Artificial habitats are particularly appropriate when the natural habitat of a species is absent or still maturing. In general all interventions should be regarded as temporary and removed when the natural habitat is more appropriate, thus removing the need for monitoring and cleaning.

It is important to minimize night-time lighting near semi-natural habitats. Light should only come on when needed and only pointed at features which ensure people's safety.

## **Support for community based initiatives**

If you want to do further research on biodiversity in your locality, see if there is a Biodiversity Action Plan for the county. A Biodiversity Action Plan, if it exists, will have been drafted by a specialist in your local authority. This person should be contacted to address specific queries, request more information or identify local individuals interested in your aspect of biodiversity. The document may provide information about local biodiversity. It will contain objectives to improve it and provide information on the organizations (statutory or non statutory) which are responsible. If your aspirations are aligned with these organisations there is particular potential to develop partnership working.

Large national organisations such as Waterways Ireland (which has a strong section on its website on biodiversity <https://www.waterwaysireland.org/biodiversity-on-irelands-waterways>) offers support to community based groups interested in learning about biodiversity in canals. Bat Conservation Ireland (env NGO) will put you in touch with local bat groups who (for a small fee) will organize an educational event in your area. Dublin City has a very active environmental NGO, the Dublin Naturalist's Field Club which regularly organizes outings for members interested in plants and general natural history. The Irish Peatland Conservation Council has excellent educational materials and runs programmes from their base in Kildare. The network of branches of BirdWatch Ireland provides similar outings to look at birds. Membership of these NGO's is very reasonable and there are concessions for students etc. Both may allow non-members to attend events as a taster of membership.

As well as providing information and support some NGO's's may have political influence. They may be represented in your local public participation network (PPN). This is a local authority structure which feeds community concerns to all local authority departments. Your local authority will have a full time Heritage Officer, or possibly a Biodiversity Officer, who would assist with information or support for projects. In recent years Local Authority Water Protection Officers have been appointed as a partnership between the EPA and local authorities to mobilise local support for good catchment management. They have potential to support community scale initiatives in relation to training and monitoring.

Your local representative should help to identify key members of staff in local authority departments such as parks, planning departments and drainage services who could support biodiversity related projects. Engineers in Drainage services could be interested in protecting local wetlands or developing new types, particularly in the context of climate change which is going to massively increase pressure on existing drainage networks.

All of these officials will respond to legitimate requests for information and support for practical projects which align with local objectives. However as they are busy people it may take some time to achieve an appropriate response. A request made through the PPN should achieve a more rapid response.

In the context of the National Parks and Wildlife Service NPWS the local ranger may respond to queries. However they are also very busy people and their priorities are

the protection of designated sites. They may be able identify local enthusiasts or relevant networks.

## **Financial resources for planning and works**

The following organisations could be approached:

- Leader companies which fund Management Plans for community owned sites which have biodiversity value.
- Heritage Council Community Grants Scheme (for surveys and publications). Contact Heritage Officer for advice.
- Community Foundations for plans and works i.e. follow up grant scheme
- NPWS (but distributed through local authorities) and principally for designated sites)
- Company sponsorship

## **Partnerships for biodiversity with schools (and local companies)**

There is particular potential to work with primary schools to enhance biodiversity as the curriculum of primary school is nature friendly. It is well known that the influence of a teacher in primary school combined with access to a site of some biodiversity interest can be of great significance to a young person in encouraging them to have a lifetime interest in biodiversity. All community based initiatives should develop a good relationship with the primary schools in their neighbourhood. The guidelines below provide a step by step guide to working with primary schools. They same principles can be used to encourage co-operation between other organisations or institutions. Large organisations and commercial companies could be interested in promoting what is now called Corporate Social Responsibility. Working in partnership with local communities on projects concerned with biodiversity will allow them to fulfil this obligation.

In relation to schools a community based initiative will involve the Tidy Towns committee working with a representative of the school community which includes

children, teachers, all other staff (caretaker and SNA's), parents and grandparents. The ideal partnership would be facilitated by someone in the school who is also active in the Tidy Towns Committee, ideally running the Green Schools initiative; where the school has some grounds to carry out a biodiversity enhancement project and there is someone around in July and August to look after plants. In relation to organisations or companies the contact will be with the CSR officer.

There is a good chance of valuable local greening training if the contact person teacher/officer is interested in wildlife and gardening, if it is a Green School which is already doing related curricular activities and there is a sympathetic principal/manager (sympathetic to the area, community, ideally from the area). Potential is greater if the school or business grounds have potential for biodiversity friendly works (landscaping or erection of bird boxes etc.) or/and is adjacent to a site of biodiversity interest. The following programme of actions is suggested.

### **Step One**

Research the expertise in your locality. You might have someone who knows birds or plants or is a keen gardener. You might have an artist in the locality who could go into a school/business, shows people how to draw nature or bring in some of their work which is related to nature. Research the kinds of freebies offered to schools/businesses from trees to posters and present this information to the school/business.

Encourage any interested teacher to get upskilled by doing summer courses on biodiversity or schools gardens (for which they get extra days off during the year). Courses registered with the Department of Education which fulfil all the criteria for EPV days at 1) Gort breac Tralee and 2) Burren Beo on place based learning are highly recommended.

Encourage the teacher/ school/business to join an environmental NGO such as Biodiversity in Schools, BirdWatch or the Irish Peatland Conservation Council which produces regular magazines or newsletters.

Provide resources to the school and business (see Appendix ?). Encourage schools to buy books produced by Paddy Madden (on school gardens and trails) and start to assemble a collection of picture books and novels concerned with biodiversity.

Discover the name of local Heritage in School expert on biodiversity, ideally who will bring pupils out of the classroom. These visits are subsidized by the Heritage Council.

### **Step Two**

Encourage school to arrange outings to places which provide interpretation about biodiversity (such as the IPCC run Lullymore Peatland Centre or Wicklow Mts National Park). If the Heritage in School person visits the school encourage them to develop a relationship with them and pay for follow up visits (if successful).

Establish a school garden which is wildlife friendly.

**Follow up provided by the Local Tidy Towns group**

Provide information so that school can bring children out (possibly with parents for insurance purposes). A trail could be set up from the school, which highlights features of biodiversity interest along it and incorporates activities, which will be carried out by pupils (questionnaire, drawings, collecting objects).

As a fun event a picnic day could take place in the outdoors each year incorporating an activity which requires observation of nature. If interested and school/business wants to promote itself an exhibition could be prepared about that space and launched with much publicity.

If school/business gets interested in biodiversity in years three or four it could sign up for surveys organized by organisations which promote citizen science (BirdWatch for garden bird survey IPCC for frog survey and the National Biodiversity Data Centre for spring flowering plant species).

A garden could be set up which includes features (wetland and log piles) of value to biodiversity and species which benefit pollinators and humans (edibles!). A school garden would encourage year round work and observation. If space allows a native tree could be planted each year in that area. That tree could be a focus of study for whole school that year (language, folklore, science, songs and usage).

## **Resources needed to support local learning about biodiversity**

*Books to aid identification (best ordered from NGO or Heritage Council)*

- Irish Grass Identification Guide
- Tree and Shrubs Swatch
- Bumblebee Swatch
- Butterfly Swatch
- Ladybird Swatch
- The Birds of Ireland – A Field Guide
- Britain's Dragonflies
- Guide to Freshwater Invertebrates
- Guide to Commoner Water Plants
- A Naturalist Guide to the Trees of Britain and Northern Europe
- The Wildflower Key
- Zoe Devlin Wildflowers of Ireland
- Teach yourself Irish Garden Bird Songs CD
- Field Guide to Moths of Great Britain and Ireland
- A Field Studies Council Guide to British Bats
- Flora of County Carlow Evelyn Booth
- Flora of County Dublin Doogue et al

**Equipment (best ordered from NGO i.e. BirdWatch Ireland , Irish Peatland Conservation Council or specialist supplier such as nhbs.com)**

- Binoculars Opticron Oregon 4 PC 8x32

*Coon Biodiversity Action Plan*

- Straight Tip Tweezers to examine small specimens
- Heavy Duty Sampling Trays for freshwater surveys
- Student Hand Net for freshwater surveys
- Echo Meter Touch 2 Bat Detector
- Botanical Drying Paper to preserve plant specimens
- Botanical Press to preserve plant specimens
- Bug Viewer Boxes – small x2 / x4 mag
- Bug Viewer Boxes – square x3 mag
- Field Lenses to allow for close examination of plant animal features

