Knockanore Biodiversity Project

A survey of the biodiversity of the village of Knockanore,
Co. Waterford, and its surrounds.
Commissioned by the Blackwater Ladies Club
Funded by the Community Foundation for Ireland

Betsy Hickey PhD., BSc. Hort Dip.
Frances Gallagher
October 2021

Contents

Figures **v**

Tables

Acknowledgements

Thanks to the following:
The Community Foundation of Ireland for making this project possible.
Ava Farrington and her team for getting this project under way, their enthusiasm and their continuous work protecting and promoting biodiversity in Knockanore.
The farm owners: Elsie Kelly, Maura Smith, and Mark Hurley for giving us their time and allowing us access their land.
Father Condon for supporting the objectives of the project.
Megan Morris and Paul Green for their invaluable help with the flora of the churchyard.
Ciaran Byrne for giving us any information he had.

1. Introduction

This report was commissioned by 'The Blackwater Ladies Club', who received funding through the Community Biodiversity Action Plan, and wanted to highlight the importance of biodiversity among the people living in and around Knockanore. They also required an assessment of biodiversity in their locality, information on managing biodiversity rich sites (if any were found), and ways of increasing diversity in public areas where it is poor. Importantly, they wanted to be included in the process.

To achieve these aims the study included:

- meetings with Ava Farrington and her team, and local landowners.
- assisting with workshops with members of the community.
- an assessment of the health and diversity of the environment in and around Knockanore village.
- ways of maintaining and protecting existing biodiversity.
- suggestions for improving biodiversity.
- an awareness on the importance of biodiversity via workshops and other events involving those living in the area.

1.1 Background

Knockanore is a small linear village (Grid ref for centre of village S2073 0089), surrounded by farmland in west Waterford. The L-2005 (a designated scenic route) runs through the village which extends for a kilometre or so in length. The lower reaches of the Munster Blackwater River, an important SAC (Special Area of Conservation, appendix 1) is only a short distance away (less than 2 km), to the east of the village. The largest nearby town is Youghal, built on the eastern side of the mouth of the Blackwater River, while the smaller town of Tallow can be found to the north.

The village name is derived from the Irish 'Cnoc an Fhomhair' or 'Cnoc an Oir', which translate as "The Hill of Autumn/Gold". Early mentions of the village include Saint Patrick's presence at the nearby ecclesiastical settlement of Glendine.

Knockanore and its hinterland are sparsely populated, with 890 people recorded in the last census.
Central to the village is the Catholic Church (The Sacred Heart Church of Knockanore), and a national school, which incorporates a community hall. Knockanore is the home of the Shamrocks, the local GAA club which represents three parishes - Glendine, Kilwatermoy (just south of Tallow) and Knockanore. Collectively they are known as the 'United Parishes'.

Initially it was hoped that the entire parish of Knockanore could be included in the study, but the land area was too large. Of necessity, it was decided to study the village of Knockanore in detail along with three farms (fig. 1).

Fig. 1 Knockanore biodiversity study area

Ava Farrington introduced us to the owners of the three chosen farms who kindly gave us permission to look closely at their land.
The Covid-19 epidemic impacted on the capacity to visit the sites and to conduct workshops with the community. Nonetheless, due to significant effort by Ava Farrington and her Team, the project brought people together and had a

very a positive effect on many local lives. It also provided a valuable focus for artistic efforts and for citizen science projects focusing on people's homes and gardens, and on the wildlife in their immediate area. It is hoped that these positive effects continue, and that the importance of biodiversity will help inform decisions in ongoing developments of the village.
Information, links etc. on improving Biodiversity can be found in appendix 5.

1.1.1 The Blackwater Ladies Club

The Blackwater Ladies Club was founded in 2001 to bring women living in the Knockanore area together to share experiences and interests, and to offer a network of support to group members in a sheltered local environment. Meetings were held monthly in the Community Hall, where local speakers shared their expertise and interests with the group. The evenings would end with time to chat and socialize over a cup of tea or coffee.
Numbers and ages of 'The Blackwater Ladies Club' have fluctuated over the years but most are in the 50 plus cohort. This is a group with influence in the village with considerable experience and interest to promote awareness of and the importance of biodiversity and caring for the environment.
The Community Foundation Grant provided the opportunity for the group to commission a professional study to highlight the issues needing to be addressed on their doorsteps.
With funding in place, workshops, newsletters, and visits to the local school were well under way until disrupted by covid. However, commitment has remained high, and members have spent over 18 months focusing on recording their own experiences and sharing their results with the community, the core biodiversity team, and the local press. The 'The Project Diary' is just one example of the many accomplishments of the group and gives an account of the progress they made.

1.2 What is biodiversity?

Biodiversity refers to the variety of life on Earth. It's a term that embraces the multitude of life forms that exist at all levels on our planet. This includes basic

genes to individual species, to their communities and the habitats (fig. 2) and ecosystems they dwell in. Essentially no one species, habitat or ecosystem can be seen in isolation, everything is interconnected. Ensuring that biodiversity is maintained is essential for all life that shares this earth, as the air, water and food that sustains us all is dependent on it.

Fig. 2 Good example of a biodiverse grassy bank habitat

1.3 What makes a habitat successful?

The basic needs of wildlife are simple enough, much like ours really. If the criteria in the list below are present or can be provided, then it's fairly straightforward.

- Food - suitable things for wildlife to eat.
- Water.
- Cover -a place to rest and hide.
- Safe places to raise young.
- Water – lake, river, drainage ditch, pond, bird bath, old containers.
- Food – roots, shoots, leaves, seeds, flowers (alive and dead), feeders.
- Shelter – natural and man-made.
- Continuity of habitat.
- Undisturbed areas -no major weeding or raking or clean-up of stems, leaf litter, dried stalks.
- Beneficial insects will have a safe place to over-winter.

1.4 *Local loss of biodiversity*

Globally there are numerous causes of biodiversity loss. At a local level these can include:

- Hedges cut out of season.
- Needless spraying.
- Overuse of plastics – even as part of our clothes e.g., fleeces.
- Weed membranes and other garden plastics.
- Overworking of soil and unnecessary "tidying".

1.5 *Approach to the survey*

Preliminary work was started in late 2019 by Ciaran Byrne (who was unable to continue with this project). From his notes and conversations with interested locals a desktop study was carried out (table 1). This included looking at local maps and making some initial field assessments. Historical maps of the area were also studied to see if links with vegetation existing at the time could be linked with current vegetation (fig. 3).

Previous studies of the herb-rich grassland in the local churchyard (The Sacred Heart Church at Knockanore), carried out by Paul R. Green, Megan Morris and others were also made available to us.

Three workshops were held before Covid restrictions curtailed efforts. Ava Farrington and her Team continued to work on appropriate aspects of the project, when and as Covid restrictions allowed (Project Diary and Four Seasons Screen). Contributions of botanical interest to Knockanore were published in the Dungarvan Leader, Dungarven Observer (local newspapers), weekly (appendix 2 for an example).

A Facebook page (Knockanore Biodiversity Project - Home | Facebook) was also set up at the beginning of the project.

A community information poster providing details about the project was produced by the Blackwater Ladies Club.

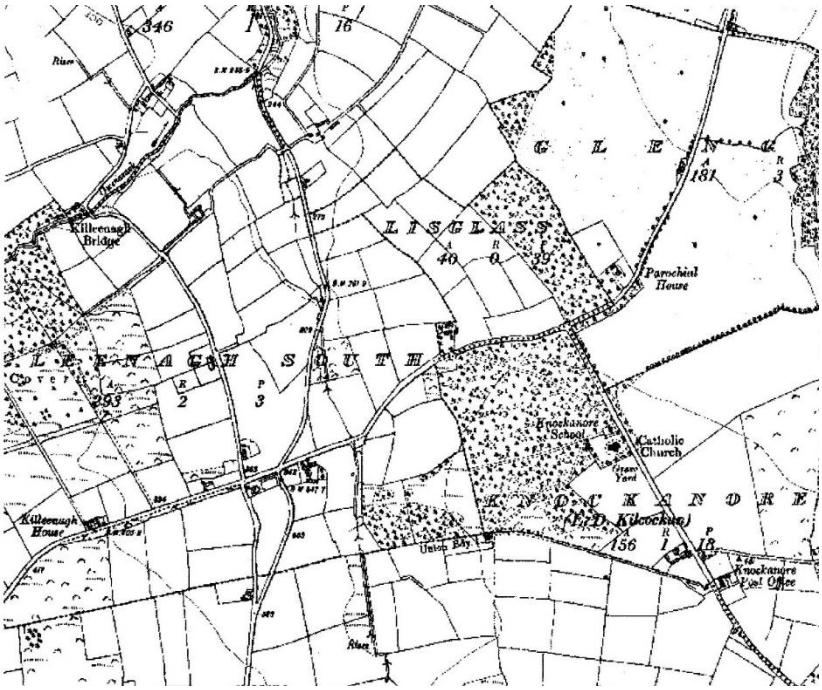

Fig. 3 19th century map of Knockanore and surrounding area

Following discussions with Ava Farrington representing the Blackwater Ladies Club the study area was divided into 4 main sections (fig. 1):

- The village of Knockanore.
- Kelly's of Killeenagh, Knockanore.
- Michael and Maura Smith's farm, Coolbeggan East, Knockanore.
- Mark Hurley's land at The Pike, Tallow, West of Knockanore.

Surveying was carried out over eight visits (appendix 4), six of these were in 2020 from July to October. The final two visits were in March and June 2021 to make sure spring and early summer flowering species were not missed. During the visits the following were recorded:

- all habitats both semi-natural and man-made (after Fossitt, ref. 1).
- detailed assessment of two different hedgerows.
- an inventory of plant species found in the different habitats.
- sightings of birds, insects, mammals etc.
- brief assessment of the quality of the habitats, and how best to maintain and protect them.

- areas with potential to increase biodiversity were identified and suggestions of how to do so were made along with their relevance to the community.
- the common or English name of plant and animal species after Scannell & Synnott (ref.2) are used throughout the report with the scientific names being found in the appendices along with the common names.
- Detailed assessment of 2 hedgerows in the study area were also carried out (using guidelines by Foulkes et al ref. 3).

2 Findings

2.1 Desktop study

Findings of the desktop study are outlined in table 1.

Table 1 Results of Desk Top Study

Information source	**Details of information**	**Value of information**
Ciaran Byrne	Opening discussions and assessing the scope of the project	Preliminary scope of project
Ava Farrington	Project coordination	Indispensable source of local information and advice
Paul R. Green	Flora of County Waterford	Valuable reference work for anyone interested in the Flora of County Waterford
Paul R. Green	List of plant species found in Knockanore Churchyard	Very detailed account of plant species in churchyard appendix 3, table19)
https://www.waterfordcouncil.ie › media › heritage, Waterford County Biodiversity Plan 2008-2013	Mention of calcareous grassland in Knockanore Churchyard	General information

Information source	Details of information	Value of information
https://floraofcountywaterford.biodiversityireland.ie	Brief description of species in churchyards	List of plant species found in churchyards
Megan Morris	Identification of bee orchids and other rare species in Churchyard	Relocated bee orchids etc. to safe area where they flowered and set seed
Waterford City and County Council	Details of traffic calming, and improvements works in Knockanore village	Good link, as they are committed to utilizing local plant species in the future
OPW (Office of Public Works)	Site synopsis of the river Blackwater in County Waterford (Site code 2170)	Background to habitats in the area

2.2 *Habitats in the Study area*

Twenty-six different habitats were recorded during the study (table 2). These included semi natural habitats such as drainage ditches, hedgerows, dry meadows and grassy verges, and riparian woodland. Man-made habitats such as buildings and artificial surfaces and spoil and spare ground were also recorded.

Table 2 Habitats found in the Knockanore Biodiversity Study

Habitat	Code
Natural stone wall	BL1A
Arable crops	BC1
Buildings and artificial surfaces	BL3
Earth banks	BL2
Non-natural stone wall	BL3A
Eroding/upland rivers	FW1
Depositing/lowland rivers	FW2
Drainage ditches	FW4
Hedgerows native species	WL1

Habitat	Code
Hedgerows non-native species	WL1A
Treelines	WL2
Spoil and spare ground	ED2
Recolonising spare ground	ED3
Improved agricultural grassland	GA1
Amenity grassland (improved)	GA2
Dry meadows and grassy verges	GS2
Dry-humid acid grassland	GS3
Wet grassland	GS4
Dense bracken	HD1
(Mixed) broadleaved woodland	WD1
Mixed broadleaved/conifer woodland	WD2
Mixed conifer woodland	WD3
Conifer plantation	WD4
Riparian woodland	WN5
Scrub	WS1
Immature woodland	WS2

2.3 Plant diversity in the study area

A total of 221 species of plants and fungi were recorded during the survey (Appendix 3, table 6). Thirty-five of these were non-native species (Appendix 3, table 6), with most of these occurring in the churchyard (Appendix 3, table 14). Interestingly, one of the most diverse habitats recorded during the study (dry meadows and grassy verges, figs. 2 & 4) with 45 plant species, was in the churchyard which was home to some scare native species such as bee orchid and adder's tongue fern.

Fig. 4 Dry meadows & grassy verge habitat in Knockanore churchyard

2.4 *Animal diversity in the study area*

No specific survey was carried out to determine fauna in the area, but any sightings or other indicators such as sound or footprints etc. were noted (Appendix 3, table 38). However, this would be a worthwhile project in the future.

2.5 *Maps*

Habitat maps of the different study areas can be found inserted at the end of the report.

3 Accounts of the individual surveyed areas

3.1 *The Village of Knockanore*

The village of Knockanore (figs. 1 & 5 and map Kelly Farm Killeenagh inserted at end of report), was divided into 2 areas: Knockanore village, and the

Churchyard. The churchyard is described separately as this botanically rich area warranted a section to itself.

3.1.1 Description of Knockanore Village

The 'Knockanore Village' area starts on the L-2005, (at the village speed limit sign) to the northwest, it keeps right at the junction with the L-6020 and continues through the village for about 1 kilometer to the speed limit signs at the southern end of the village. Both sides of the L-2005 (figs. 1 & 5 and map 'Kelly Farm Killeenagh' inserted at end of report),) were surveyed.

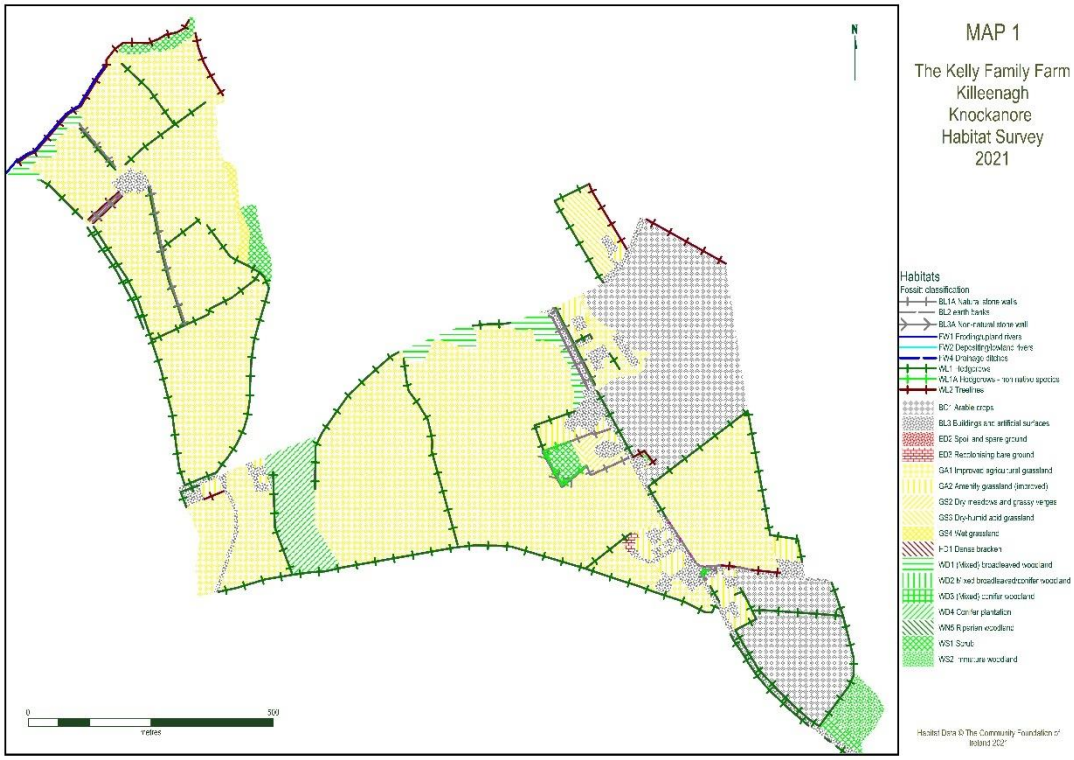

Fig. 5 Habitats in the village of Knockanore and on the farm of Kelly's of Killeenagh, Knockanore

The smaller side-road, the L-6020, continues towards the Parochial House, and then past John F. Kennedy Park, part of which accommodates the GAA practice grounds/Community Field. Hedgerows form the boundaries between the fields and the road. The Parochial House is a substantial building, with a garden and outbuildings.

3.1.2 Findings

Fifteen habitats were recorded in the village area of Knocknore. Six of these were semi-natural and the rest man-made (table 3). Earth banks and dry meadows and grassy verges habitats were the most diverse with 92 species occurring on earth banks and 49 species in the dry meadows and grassy verges habitat (appendix 3, tables 11 & 7 respectively). Species composition on earth banks included yarrow, woodsage, wild strawberry, tufted vetch, and maidenhair spleenwort. Several of the species found on earth banks (appendix 3, table 9were also evident in dry meadows and grassy verges, but species such as cat's ear, early forget-me-not, and lady's mantle were specific to the dry meadows and grassy verges. Dry-humid acid grassland (GS3, appendix 3, table 8) was found on some of the wider verges in the village.

Table 3 Habitats (area-based habitats (ha) and linear ones (m)) in Knockanore and on Kelly's of Killeenagh's farm

Habitat code	Habitat	Area (ha)	Length (m)
BC1	Arable crops	15.57	
BL3	Buildings and artificial surfaces	4.16	
ED3	Recolonising bare ground	0.09	
GA1	Improved agricultural grassland	54.04	
GA2	Amenity grassland (improved)	2.23	
GS2	Dry meadows and grassy verges	0.37	
GS3	Dry-humid acid grassland	1.13	
GS4	Wet grassland	0.34	
WD1	(Mixed) broadleaved woodland	1.58	
WD4	Conifer plantation	2.36	
WN5	Riparian woodland	0.42	
WS1	Scrub	1.55	
WS2	Immature woodland	0.89	
BL1A	Natural stone wall		1157.39
BL2	Earth banks		190.77

Habitat code	Habitat	Area (ha)	Length (m)
BL3A	Non-natural stone wall		146.19
FW1	Eroding/upland river		302.25
WL1	Hedgerows native species		7716.81
WL1A	Hedgerows non-native species		227.54
WL2	Tree lines		1320.18

Two small areas of broadleaved woodland (table 9, figs. 1 & 5 and map 'Kelly Farm Killeenagh' inserted at end of report), Cotter's wood (fig. 6 at the northern end of the village) and the woodland south of the village (fig 9.), were planted at approximately the same time using a very similar tree mix of mainly deciduous species, dominated by beech. These do not seem to have been thinned or managed as forestry. Though they are unlikely to have much value as commercial timber, they are attractive, and provide small pieces of useful habitat. They may harbour some of the woodland species found in the nearby Blackwater Valley SAC (appendix 1). Open woodland such as this (fig. 6), with deep leaf litter underfoot is pleasant to walk through and could make an interesting route for a woodland path, or an area for ecological exploration by the school or by interested groups.

The proximity of Cotter's Wood to the school makes it ideal for study, and the school could avail of an ecologist from the Heritage in Schools program to help with this.

Understory plants found in Cotters' wood include herb Robert, blue bells, and foxgloves. In addition, there are some interesting fungi growing on dead timber (appendix 3, table 9). The wall bounding the wood to the north has a good range of woodland species, such as goldenrod, honeysuckle, and scaly male fern.

The northern approach road is somewhat dangerous, due to poor visibility caused by the right-angle bend on the outskirts of the village. However, the County Council have begun works widening and re-aligning the road junction and improving visibility so this should no longer be an issue.

The Area Engineer responsible for this has indicated any felled timber could be kept in the area for use for seating, rustic fencing, habitat piles etc. by groups

within the local community. Stone removed from the banks could also be stored locally for uses such as bank and wall repair.
There is ample space at the Recycling Centre and in other parts of Knockanore for unobtrusive storage of useful materials.

Fig. 6 Cotters Wood – a small woodland north of Knockanore village

There are around 12 houses in the village, this includes the two in An Maoilin. In addition to the primary school and church there is a former parochial house, a small civic amenity/recycling area in the car park south of the church. There was a small shop (fig 7), and a pub, but these have both closed in recent years as has the health centre next to the school.
Stone breasted banks mark the boundaries between the fields and the road (L-2005) except where there are houses or other buildings (fig. 8).
Agricultural land (mainly arable) can be found on both sides of the road. The banks tend to be a bit overgrown and the vegetation, rank. In general, the banks are in good repair.
Apparently, some of this roadside land within the area of the village is zoned for housing development. It would make sense for any increase in population in this rural area to be accommodated in an existing village, which is already equipped with a school and other infrastructure.

The wall and meadow on the south-eastern side of the L-2005 has a rich diversity of dry meadow species which are worth conserving (fig. 8, appendix 3, table 7).

Fig. 7 Former shop in Knockanore

At the southern end of the village a small beech woodland (fig. 9, figs. 1 & 5 and map 'Kelly Farm Killeenagh' inserted at end of report) can be found either side of the small road opposite the former Shamrock Pub. The stone-faced banks that line the road (fig. 9) are covered in a rich mix of ferns, mosses, and woodland plants (appendix 3, table 11).

3.1.3 Strengths

- Cotter's wood is an interesting approach to the village.
- It supports a range of species adding to local biodiversity.
- It's an area of mature beech trees that could be used (with permission) as part of a nature trail, study area for local school etc.
- It will be accessible when the new paths are finished.
- The main street is wide, and the trees that are found at both ends of the village are attractive.

- The presence of dry meadows and grassy verges vegetation are an integral part of stone banks, with the plant roots and foliage protecting them from erosion from rain.

Fig. 8 Section of stone breasted bank with GS2 (Dry meadow and grassy verge vegetation) growing on top of the bank in the south of the village

- The stone-built piers and original traditional iron gate near the road junction, opposite the former Shamrock Pub, are a living connection with the past (fig. 10).
- The small woodland to the south-east could be an attractive route to walk or cycle; its flora is very similar to Cotter's Wood (Appendix 3, table 9).
- The road through the village (L-005) forms parts of a Heritage Route, the Sean Kelly Cycling Trail.

3.1.4 Weaknesses

- Some agricultural waste on the western side of Cotter's wood is detracting from it.
- As a village, Knockanore lacks a centre, also it isn't always easy for visitors to know when they have entered or left it (little or no signage).

The loss of key infrastructure (shop, pub, post office etc.) exacerbates this, however addressing these issues is far beyond the remit of this project.

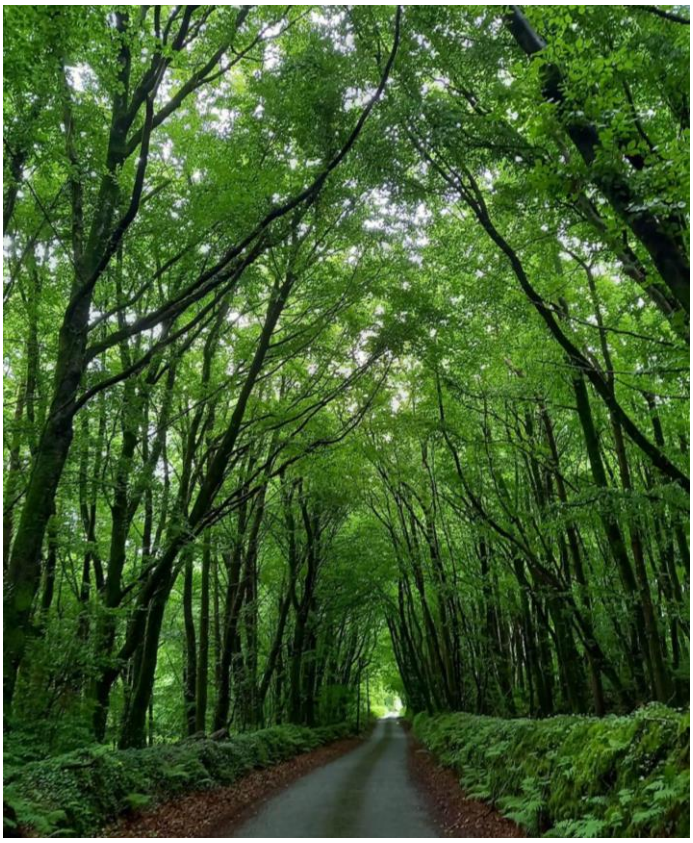

Fig. 9 Beech woodland either side of the road to the southeast of the village

- During the survey the lack of footpaths in the village was noted but since then a scheme to provide safe pedestrian access with street lighting and suitable speed limits, from the centre of the village to the sports grounds in John F. Kennedy Park, is now underway.
- The civic amenity site while functional is underutilized, and not the most attractive. In terms of biodiversity the hedgerow is quite good but there is scope to increase biodiversity here (appendix 3, table 10).
- Derelict or disused buildings such as the shop and health centre present an air of neglect and reduce the attractiveness of an area.

Fig. 10 Traditional gate and gate posts almost opposite the former Shamrock pub

- The housing development An Maoilin is well presented and has a mown grassy area. There is scope here to increase biodiversity and include some colour and interest to the estate throughout the year without going to much trouble or expense. To the rear of the development a small meadow established itself and if properly managed it would lead to more local native species becoming established (appendix 3, table 8).
- Some of the finest trees in and around the village are ash. Ash dieback disease is spreading through the ash population countrywide, and most will likely die, leaving gaps in hedgerows etc. resulting in a changed landscape and reduced biodiversity and significant loss of habitat.
- Litter in the village itself was not an issue but it is a problem in the beech woods. Tyres and other rubbish have been dumped among the trees. This is not helped by breaches in the fence and banks.
- Unremoved cut material from the bank and verge along the stretch of L-2005 north-west before Cotter's Woods is blocking road drains, where it breaks down, leading to enrichment of the habitat resulting in rank growth of some species such as nettles and hog weed at the expense of others.

- A small County Council substation interrupts this bank. It is not an attractive structure, and the cleared area around it has been used as a dump for garden waste (as has the adjacent small lay-by).
- The stone-faced banks near the church, school and amenity area have been routinely treated with systemic herbicides (fig. 11), leaving them bare and vulnerable to weather damage. The stones have collapsed in places, and some have fallen and been removed.

Fig. 11 Sprayed section of stone breasted bank and subsequent collape of part of it

- The lack of a water source such as a pond and/or wetland area in the village to support wildlife is noteworthy. The river Blackwater is little more than a kilometer away, but this is quite a long distance for small animals and birds to travel, especially in hot weather.

3.1.5 Threats

- The stone-faced banks near the church, school and amenity area are collapsing in places, and some stones have fallen out and been removed. This is largely due to being routinely treated with systemic herbicides, leaving them bare and vulnerable to weather damage.

- Hedgerow cutting out of season threatens biodiversity as it can interfere with nesting, flowering and subsequent seed or fruit development reducing the availability of food etc. for wildlife.

3.1.6 Opportunities

- The footpaths and the road crossing point/ traffic calming scheme that are currently under construction by Waterford County Council will make the village safer for everyone as it will link the school, the church, and the civic amenity\recycling centre with John F. Kennedy Community Park and the GAA training grounds. Hopefully this will serve to re-focus attention on the area encouraging healthy activities such as walking and cycling. As it is, the road through the village (L-005) forms parts of a Heritage Route, the Sean Kelly Cycling Trail.
- To use biodiversity rich planting in beds as part of traffic calming (fig. 12).
- To provide signage with the name of the village in the region of the village speed limit at southern and at the northern road approach roads.
- The new paths in the village could be integrated with local plans for a Nature Trail which could include Cotters' wood (subject to permission from its owner).
- Cotters' wood could be used as an area in which to study ecology (subject to permission from its owner).
- To restore the damaged sections of stone-faced banks and agree on a program for their long-term care. This could be carried out as part of a training scheme.
- To increase the use of the parochial house garden and surroundings. During the survey the garden was used to host workshops.
- There are several opportunities to increase biodiversity in An Maoilin housing development without too much effort. There is a considerable expanse of bare wall which could be planted with self-clinging/supporting climbers while some of the grassy areas could be developed as meadow and or planted with some trees.
- To provide continuity of habitat.
- The biodiversity rich hedgerow on the southern boundary of the civic amenity area could be safely used by the local school and or other groups as a study area for hedgerows.

- To increase biodiversity in the civic amenity site e.g., along the other boundaries and in the corners etc.
- The civic amenity site could also be used for developments such as picnic benches, a children's play area, a small community garden, or the weekly presence of a mobile cafe, market, or food stall, if there were sufficient local interest.
- To monitor the progression of ash-die back as a project for local school or local group or an interested older student. It would be interesting to monitor these and see if any are disease resistant and to consider possible replacement trees if it becomes necessary.
- To consider reviving or repurposing the Health Centre, at least for occasional use.
- To construct a pond or permanent water feature - even a fountain or birdbath - would provide a drinking place for less mobile creatures (e.g., amphibians, small mammals, insects, and birds). This would increase biodiversity and create an accessible new habitat for children and interested adults.
- To remove the litter in the beech woods. It would not take too much effort to clean these up, if a few people came together for a few hours or could be incorporated as part of the County Council annual spring clean scheme. Some repair of the fences and banks would also be useful.
- To collect native seeds from donor sites where there is an abundance for future use. For example, the meadow at the back of An Maoilin is one possible site and if this is being developed, the seed or some of the plants should be saved.

3.1.7 Actions

- Remove the waste cut material from around the County Council substation and use it for composting. All cut material from roadside verges and hedgerows should be routinely removed after trimming, Ideally, some of the enriched turf should be scraped away as this will leave a good surface for more attractive wildflowers to establish or planted using seeds from promising local donor sites.

- Stop spraying roadside verges and use a strimmer or a slash hook to control vegetation that is obstructing sight lines etc.
- Plant locally sourced honeysuckle or other native climbing plants by the fence surrounding the substation, to soften its harsh impact.

Fig. 12 Using plants to calm traffic

- Likewise, the banks at the northern end of the village tend to be overgrown and dominated by rank vegetation (nettles and hogweed), but generally in good repair. A small amount of work and more carefully timed seasonal hedge cutting would make a big difference to the appearance and biodiversity of these banks and verges.
- To provide continuity of habitat.
- Consult owner of Cotter's wood to see if it is possible for it to be used by the community.
- Increase biodiversity in An Maoilin by planting the walls with climbing plants. Plant trees such as ornamentals, natives and/or fruit bearing trees or a mixture of these (appendix 5). In addition to supporting biodiversity these would increase the overall attractiveness of the estate.
- The small area behind the development, could be managed as a meadow, without much effort. This would involve mowing the area once or twice a year and removing the cut material, leading to greater

diversity with more local native species becoming established (appendix 5).

- Save seeds from potential donor sites.
- Discuss with County Council potential traffic calming measures using pollinator friendly plants.

3.2 The Churchyard

3.2.1 Description:

The churchyard of the Sacred Heart Church at Knockanore (figs. 1 & 5 and map Kelly Farm Killeenagh inserted at end of report), has been described by botanist Paul Green as 'Botanically the best churchyard in Co. Waterford' (Ref. 4, appendix 3 table 19). The grass areas which are managed as lawn, or in strips of mown grass between the graves are a good example of dry meadows and grassy verges habitat (GS2). Deep shade from the church, and rainwater from its roof results in patches of damp grass, leading to a range of different species creating greater biodiversity. More than 46 plant species including some which are only occasionally seen in Ireland such as fairy flax, bee orchid and adder's tongue fern (fig. 13), were found in the managed grassy areas during the survey (appendix 3 table 13). Paul R. Green recorded a total of 111 different species in the churchyard (appendix 3 X table 19) making it one the richest floristic areas encountered within the Knockanore study area.

Areas like the churchyard in Knockanore preserve small fragments of the sort of grassland that would have been typical of West Waterford from the end of the last ice age (around twelve thousand years ago) until the late twentieth century. These habitats would have spread over most of the areas that are now GA1 (agricultural grassland) on our maps.

Preserving this layer of semi-natural grassland, with its wealth of scarce and unusual plants and invertebrates is vital for supporting biodiversity. These plants are often sensitive to disturbance and/or enrichment. They are seldom large or showy e.g., common twayblade and mosses and are easily overlooked as being unimportant.

The churchyard is bounded by walls on three sides. The wall separating it from the road and village is plastered, painted, and fitted with attractive metal gates.

Both the southern and north boundaries (separating the churchyard from agricultural fields to the south and the school to the north), are fine stone walls.

Fig. 13Adder's tongue fern in Knockanore churchyard

The fourth wall was levelled around forty years ago, when the adjacent field was added to the churchyard. Its edges are planted with dense rows of Leyland cypress. The land enclosed here is colonized by ruderal coarse species such as hogweed, briars, gorse, and nettles (fig. 14, appendix 3, table 18)), and is reverting to scrub (fig. 14).

3.2.2 Strengths

- The current grass management regime has conserved the rich biodiversity in the churchyard. Hopefully the church grounds will continue to act as a refuge.
- The church building which is well maintained and attractive.
- The provision of clean, well-maintained toilet facilities available to the public behind the church is both practical and generous.
- The stone wall that surrounds two sides of the churchyard. The many cracks and crevices in the joints are potential sites for several species of fern. For instance, the wall next to the small toilet block (fig 15), which

borders the school, provides a habitat for at least five different species of ferns (e.g., wall rue and black spleenwort, fig. 15, appendix 3, table 16), a few flowering species such as cat's-ear and thyme-leaved speedwell as well as mosses and lichens.

Fig. 14 Area enclosed by leyland cypress and is reverting to scrub

- Presence of small tree lines of yew and holly next to graves within the churchyard (appendix 3, table 17).

3.2.3 Weaknesses

- In recent years, the grassy areas within the original churchyard have been mown very short at frequent intervals which prevents many plants from flowering and setting seed. This may prevent the species from regenerating as well as denying birds, insects etc. a source of food.
- The areas around the paths and graves have had repeated applications of systemic herbicides. Apart from being unsightly (fig 16), this reduces biodiversity, damages the structure of the soil, and leaves the exposed soil susceptible to erosion and compaction (appendix 3, table 18).

- The number of newer graves has increased, leaving less of the original habitat. It is a worry that future developments might endanger this area's botanical richness.

Fig. 15 Section of wall colonised by hart's tongue fern, wall rue and black spleenwort species of fern

- Most of stone wall (fig. 16) that surrounds the churchyard has been treated with herbicides to prevent plant growth. This will also damage any insect species reliant on the plants in addition to damaging the mortar in the joints.
- The Leyland cypresses trees which surround this area are probably the least biologically valuable trees for their size and density. They are an artificial hybrid of non-native trees.
- At present, the area is reverting to scrub. While this is not without biological interest and is a source of shelter and food for many species (appendix 3 table 15), it may be more in keeping with the rest of the church grounds to prevent it from becoming too woody.

Fig. 16 Section of stonewall in churchyard, showing aftermath of spraying

3.2.4 Threats

- The mowing regime within the churchyard prevents several species from flowering, detrimental to the regeneration of some of them and reduces available food for many species who rely on nectar and seeds etc.
- As the churchyard increases in use the area's botanical richness is likely to decrease.
- Continuous use of herbicide on paths and walls will lead to a reduction in species diversity causing harm to non-target species, including amphibians and insects. They are a serious threat to some of the more sensitive plants such as bee orchid, arctic eyebright and common twayblade (fig. 17).
- Herbicides also damages soil structure. Soils that are covered by suitable vegetation are less vulnerable to problems of erosion and compaction. (Herbicides can be costly, and more importantly, they may cause health damage to those involved in its application and to others who are exposed to them.
- Additionally, the elimination of most or all plants from areas of wall and ground, reduces the character and beauty of the churchyard (fig. 18).

- Parts of the churchyard are used to dump horticultural waste (grass clippings, weeds, pruning's etc.) and for a small amount of builder's rubble.

Fig. 17 Common twayblade in June

3.2.5 Opportunities

- To increase biodiversity by no longer spraying or removing plants from the stone walls.
- The un-sprayed wall near the small toilet block, provides a habitat for at least five types of ferns along with mosses, lichens, and a few flowering plants. This small area could be used as a seed/spore source for other, damaged areas of wall. It also shows how much more attractive a wall can be when managed for, rather than against, environmental richness.
- To preserve and value the rich trove of native plants that are found in in the churchyard and that seeds from this area might be used to improve diversity in nearby amenity areas.
- To provide continuity of habitat.

- To grow plants which promote biodiversity for planting on graves, in containers or in the Churchyard flower beds. The community is fortunate to have a very knowledgeable advisor, Teresa Barry of Barry's Nursery, who might advise on such a project.

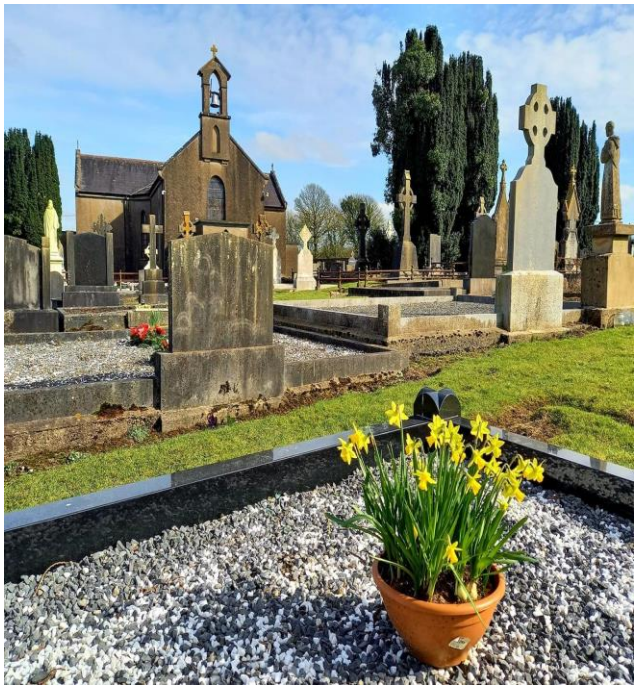

Fig. 18 The churchyard in March and the aftermath of spraying results in bare dirty looking areas prone to erosion and compaction

- The area behind the churchyard is bounded by Leyland cypress. While they do provide shelter and a certain amount of habitat diversity, it would be good to plan towards replacing them with a species-rich hedge of native shrubs and trees.
- Their timber may be of some value; they are well-grown and reasonably straight. Local use of this wood (or its sale as firewood) might subsidise other costs.
- Waste wood could also be used in habitat piles or chipped to provide a surface for woodland paths and as a weed suppressant in some unused areas (preferable to the routine use of large amounts of herbicide).
- The long-term strategy is to use this area (enclosed by the Leyland cypress) as an extension to the older churchyard, as the number of grave plots increase. If this were possible it would save some of the existing

older turf and the diversity of species found within it. However, the rate of increase is slow, and it may be possible to use this area for the short- to medium-term benefit of the community, without impacting on the long-term plan. It could be fenced with a portable electric unit and grazed by sheep, goats, or other animals, or it could be cut/strimmed in stages (avoiding times when birds etc. might be nesting).

- Another use could be to provide allotments, for the adjacent school or for other interested groups or individuals.
- It might also be developed as a meadow by carefully seeding a suitable area with herb-rich hay from the main churchyard, or by transplanting notable plants and herb-rich turf from plots that are to be used as graves. Megan Morris has successfully transplanted bee orchids, common twayblades and others unusual, delicate plants from a vulnerable site to a new enclosed area within the churchyard (fig. 19). These are difficult plants to move successfully, and the skill and aftercare involved in this project is noteworthy.
- Parts of the churchyard are used to dump horticultural waste (grass clippings, weeds, pruning's etc.) and builder's rubble. Garden waste would be better managed by building compost bins and using them systematically. This could provide compost for the church flowerbeds.

3.2.6 Actions

- Stop spraying herbicide on walls and paths. The paths could be managed by running a lawn mower over them creating a 'green path'. A review of management practices, focusing on more targeted weed management is another possibility. The NBDC (National Biodiversity Data Centre) document, 'Working Together for Biodiversity' (Ref. 2) contains some useful ideas for the management of Church grounds.
- Collect seeds from species rich patches of meadow to sow in other appropriate areas or to grow young plant for transplanting.
- To provide continuity of habitat.
- Relax the mowing regime allowing species rich areas to bloom and set seed before cutting. The herb-rich hay could be cut and collected to replenish the seed bank or strewn on other potential wildflower meadow areas, such as the grassy verges of new footpaths. It would also be

interesting to see the range of pollinating insects which might be drawn to different area by these flowers.

Fig. 19 Successful transplanting of bee orchid, common twayblade along with other vulnerable species to a new site in the churchyard

- Construction and demolition waste (in the area enclosed by Leyland cypress, in the main churchyard and by the school boundary wall) should be disposed of properly, off site.
- Manage the garden waste by building compost bins. This could provide compost for the church flowerbeds and other local uses.
- Decide on whether to leave the area where the Leyland cypress are to develop as scrub or to give it a different function such as listed in section 3.2.5.

3.3 Kelly's of Killeenagh, Knockanore

3.3.1 Description

Kelly's farm is close to Knockanore Village (figs. 1 & 5 and map Kelly Farm Killeenagh inserted at end of report, Grid ref: 206540 089565). It is extensively managed and consequently it is rich in biodiversity. Until recently the land was grazed by cattle but now, most of the grassland is harvested for silage or hay. While there has been some use of herbicides, and most of the meadows have been re-seeded at some stage, a good range of native herbaceous plants are present. There are several small species rich habitats on the farm including some good areas of wet meadow (appendix 3, table 20), diverse and mature hedgerows (appendix 3, tables 25, 26, &27), small patches of scrub (appendix 3, table 22), and patches of deciduous woodland (table 3 & table 24 in appendix 3). One of the hedgerows that was studied in detail occurred on this farm (figs. 1 & 5 and map Kelly Farm Killeenagh inserted at end of report, appendix 3, tables 26 & 27). At the base of some hedgerows there are margins with dry-humid acid grassland species (appendix 3, table 21).

The northern boundary of the farm is adjacent to the Owenasac river (appendix 3, table 23), which forms part of the Blackwater Cork/Waterford River SAC (fig. 20, appendix 1).

It flows through Glengoagh joining the river Bride, just before it in turn, joins the Blackwater. This confluence is surrounded by nationally wet woodland. The river and the adjacent woodland are included in the SAC.

The river is flanked by steep slopes dominated by riparian woodland (WN5), next to the river (fig. 5 and map Kelly Farm Killeenagh inserted at end of report, fig. 21). The woodland has most likely occupied this site for several hundred years at least and probably longer. It is present on the OS maps of the 19th Century (fig. 20). On the drier upper slope mature ornamental cherries and can be found. Typical species of riparian woodland include willow species, occasional alder, wild angelica, meadowsweet and unfortunately the invasive Himalayan balsam appendix 3, table 24). Himalayan balsam shades out native species in spring and summer, then in winter it dies back, leaving the ground beneath it bare and vulnerable to erosion.

This can lead to riverbank collapse and to silting up of water. This can lead to a reduction in the quality of sites where salmon or trout breed.
While Himalayan balsam it is not dominating it makes senses to remove it before it does.

Fig. 21 Upper slopes of riparian woodland area on Kelly's Farm

3.3.2 Strengths

- Good species rich hedgerows
- Wet riparian woodland
- Wet meadow habitat - small biodiverse area of wet meadow with an abundance of devil's-bit scabious (fig. 22), which is the food plant of the rare marsh fritillary (*Euphydryas aurinia,* ref. 9*)* butterfly.
- Drainage ditches
- Small stream (appendix 3, table 23)
- Old blackthorn tree/shrubs near the bridge over the Owenasac (local stream)
- Good numbers of more common butterflies (Ringlet and Small Tortoiseshell) and day-flying moths were observed in this area.
- Small pockets of deciduous woodland (fig. 21)

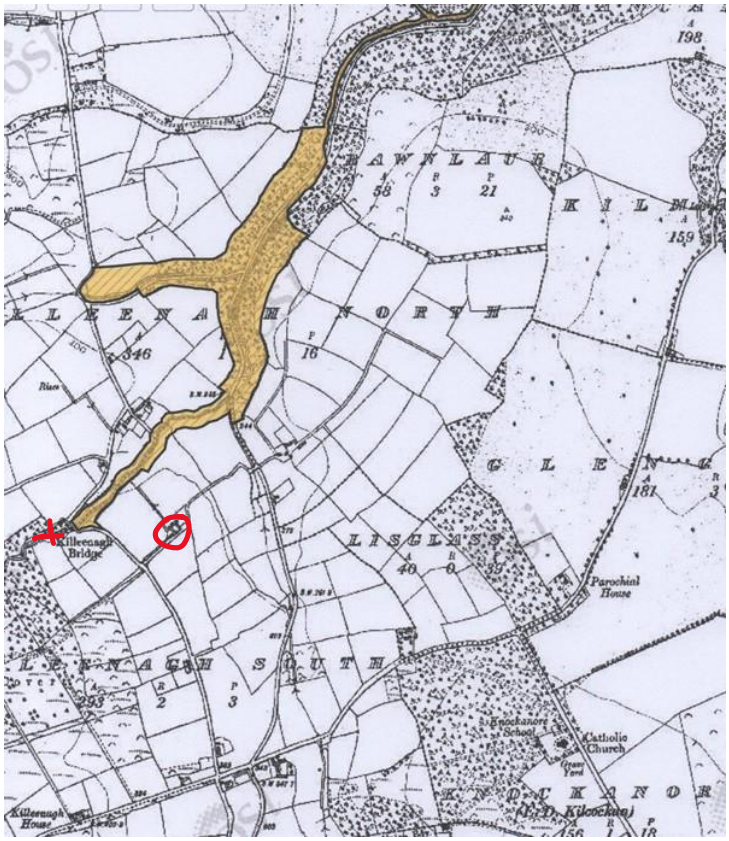

Fig. 20 Map showing part of the Blackwater River SAC which borders Kelly's of Killeenagh Farm . The farm is indicated by the red circle and the upper reach of the SAC is indicated by the x at Killeenagh Bridge.

3.3.3 Weaknesses

- Presence of the invasive plant species Himalayan balsam.

3.3.4 Threats

- A reduction of biodiversity should pesticide/herbicide or fertilizer be increased in the future.
- Spread of the invasive plant species Himalayan balsam if not checked annually and removed if present.

3.3.5 Opportunities

- To propagate from existing species e.g., the sloes on old blackthorns near the bridge over the Owenasac, could be propagated to enrich the hedgerows and ensure continuity of a small but valuable local resource.

- To use some of the hay from the wet meadow to seed and increase biodiversity in other local damp areas with seeds of genuinely local wild plants and other organisms.

Fig. 22 Devil's-bit scabious

- To monitor the wet meadow with the devil's-bit scabious to see if it is supporting the marsh fritillary butterfly.
- Continuity of habitat

3.3.6 Actions

- Remove the invasive plant species Himalayan balsam. Remove it by hand pulling before it sets seeds and spreads.
- Propagate from existing woody species e.g., holly, hawthorn, hazel, and the blackthorn
- Save hay from wet meadow and spread on suitable damp sites.

- Monitor the wet meadow with the devil's-bit scabious for evidence of the Marsh Fritillary butterfly.
- Ensure continuity of habitat

3.4 Michael and Maura Smith's farm, Coolbeggan East, Knockanore

3.4.1 Descriptions

Smith's farm (figs. 1 & 23, and map Smith Family Farm inserted at the end of report, grid ref.: 206778 087209) is managed for the grazing and milking of dairy cattle and is dominated by improved agricultural grassland habitat (GA1, fig. 24). The farm is however biologically diverse (table 4). Small country roads border the farm on three sides (figs. 1 & 23, and map Smith Family Farm inserted at the end of report). The farm was surveyed by walking through fields, areas of woodland and or from the road.

Areas of mixed forest, coniferous plantation (fig. 23, appendix 3, tables 31 & 32), have been planted (around 50 years ago) next to the road and in small blocks within the farm. Species were chosen to suit site characteristics. Low level management has been practiced in most of the wooded areas leading to small patches of beneficial habitat. Ground flora included wood sage, opposite leaved golden saxifrage, tutsan, and yellow pimpernel (appendix 3 table 32). There is a small copse/ tree line dominated by mature Scot's pine to the northeast of the farm. Pinecones in the leaf litter beneath the trees, have marks characteristic of having been fed on by red squirrels, indicating their presence in the area. Old nutshells from the nearby hazel trees also show marks of having been used as food, both by squirrels and by mice (ref. 6).

Semi natural habitats include riparian woodland (fig. 25, appendix 3, table 34), scrub, depositing lowland rivers (appendix 3, table 30), native hedgerow appendix 3, tables 28 & 29), and earth banks, but their extent is small (table 4). A small stream (appendix 3, table 30), crosses the land, joining another that runs along the southern roadside boundary. Wet habitats are relatively scarce apart from drainage ditches, although there is a small stream which discharges to the

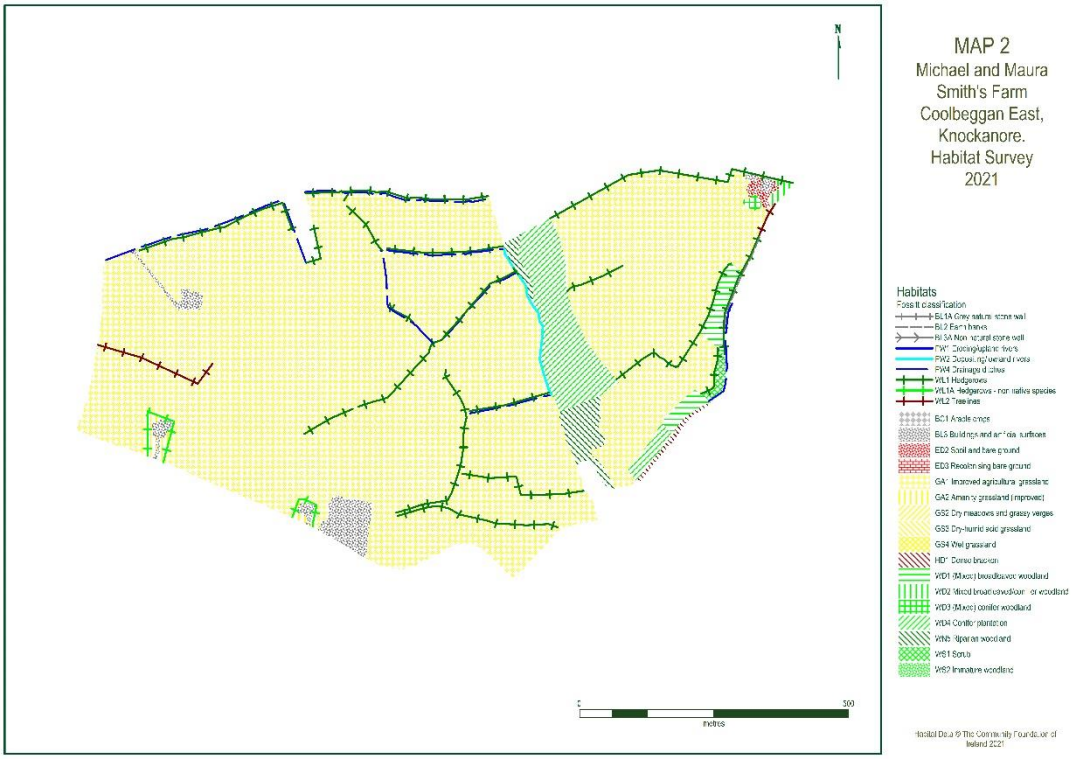

Fig. 23 Habitat map of Maura Smiths farm in Coolbeggan East

south of the property and is one of the few permanent waterways within the study area. It may be of salmonid quality. It forms a useful area for small animals to find drinking water, and a potentially interesting habitat.

Fig. 24 Smith's farm with grassland and an area of coniferous woodland

Table 4 Habitats area based (ha) and linear habitats (m) Smith's farm

Habitat code	Habitat	Area (ha)	Length (m)
BL3	Buildings and artificial surfaces	1.23	
ED2	Spoil and spare ground	0.14	
GA1	Improved agricultural grassland	58.77	
GA2	Amenity grassland (improved)	0.28	
HD1	Dense bracken	0.14	
WD1	(Mixed) broadleaved woodland	0.76	
WD2	Mixed broadleaved/conifer woodland	0.1	
WD3	(Mixed) conifer woodland	0.07	
WD4	Conifer plantation	3.08	
WN5	Riparian woodland	0.98	
WS1	Scrub	0.18	
BL2	Earth banks		178.02
FW2	Depositing/lowland rivers		294.16
FW4	Drainage ditches		1780.92
WL1	Hedgerows native species		4029.97
WL1A	Hedgerows non-native species		4029.97
WL2	tree lines		312.77

3.4.2 Strengths

- Wooded areas – low level of management, little disturbance. The mature Scots pine in the northeast corner of the farm for example provide a source of nuts for bird and animal species including the red squirrel. Some value as a timber source.
- Source of propagating material.
- Scrub important as food source hawthorn (appendix 3, table 33), – hazel scrub source of pollen early in the year, the leaves are eaten by and in autumn source of nuts for mice, squirrels etc., shelter, understory supports number of shade species such as primrose, violet and wood sage all sources of nectar and pollen and seeds. Can be coppiced to provide posts and as plant supports and for wattle making. Hazel, the

nut is an amazing sustenance: Weight for weight with hen's eggs, hazelnuts contain 50% more protein, five times the carbohydrate content and seven times the fat (ref. 6).

- Hawthorn and sloes medicinal value.
- Blackthorn scrub.
- Drainage ditches - carry nutrients from one area to another, support wet land species of plants and animals – frog spawn, corridor along which wetland species can travel.
- Stream, similar to drainage ditches link these and carry nutrients etc, are there all year round, corridor for species to move along, spawning sites for salmonids, nursery areas for fish fry.
- Hedgerows - green corridor for animal and plants species to move along, source of food for numerous species of birds, mammals and insects, safe nest sites if over 4 ft tall. Hawthorn the main shrub specie in most Irish hedgerows – stock proof originally, food source medicinal source, pollen, nectar, leaves hawthorn shield bug. It can support around 300 insect species (ref. 7).
- Grassland areas – short grass good for thrushes and blackbirds for feeding and marine birds to feed on. Areas left uncut or not sprayed adjacent to hedge good as permits small mammals to move from place to place undetected.
- Some of the plant species are also found in the nearby Blackwater Valley SAC Appendix 1 and appendix 3 tables 33 & 34).

3.4.3 Weaknesses

- Most of the wooded areas are coniferous and less valuable for wildlife.
- Low level of management, reduced value of timber.
- Drainage ditches - carry nutrients from one area to another, may carry an excess of nutrients due to run off from fertilizer and slurry which are detrimental to wet land species of plants and animals – frog spawn, corridor along which wetland species can travel.
- Stream, similar to drainage ditches and tend to be linked, again will carry excess nutrients etc. they are present all year round, corridor for species to move along, spawning sites for salmonids, nursery areas for fish fry – can transport pollutants over a considerable distance leading to

damage on site and at distance from it – can make it to sea – affecting marine species.

Fig. 25 Riparian woodland on Smiths farm

- Animals if given unrestrained access to streams can damage banks leading to erosion and muddied water which may affect spawning fish who need clean gravelly areas for successful spawning. If eggs become buried in silt they will be deprived of oxygen and die.
- Hedgerows – uniformly low-cut hedgerows less than 4 foot high not good for nest sites – not safe from predators. Lack of look outposts if none of the hedgerow allowed to grow uncut, over cutting reduces food source, fewer flowers, less fruit.
- Heavily fertilized grass and continuous slurry spreading reduces the natural fauna and flora of the soil, reducing species composition in the grass – generally low diversity usually consisting of few species other than perennial ryegrass, clover, and some docks.

3.4.4 Threats

- Clearance of scrub has a deleterious effect on plant and animal diversity due to the importance of species such as hazel as a food source throughout the year – hazel scrub is a source of pollen early in the year, the leaves are eaten by a diversity of insects and other herbivores, and in

autumn source of nuts for mice, squirrels etc. (ref. 7), shelter, understory supports number of shade species such as primrose, violet and wood sage all sources of nectar and pollen and seeds.

- Potential of drainage ditches and streams to carry nutrients from one area to another, reducing the quality of these habitats including spawning sites for salmonids, nursery areas for fish fry.
- Hedgerow removal reduces green corridor for animal and plants species to move along, food sources for numerous species of birds, mammals and insects and as safe nest.
- Spraying of grassland verges reduces and damages habitat for wildlife in particular pollinator species.
- Overgrazing – while grazing animals are a natural part of a woodland ecosystem e.g., red deer, would have grazed and browsed our woods in the past and their activities would have created clearings and gaps and disturbed the soil. This can be beneficial because it prevents any one species dominating the herb layer, encourages a variety of plants and aids the regeneration of trees. However, there is a fine balance between a healthy level of grazing and too much grazing. Today, some of our woodlands are over-grazed, with the result that the herb layer is almost absent and plants cannot flower and set seed, while tree seedlings and saplings are destroyed. In the long-term, this leads to the loss of the wood as the older trees die off and there are no younger trees surviving to replace them. While deer are a major – and increasing - cause of overgrazing, sheep and cattle can also cause damage.
- Woodland clearance leads to the loss of the woodland. This is particularly serious for long-established or ancient woodlands which contain the greatest amount of biodiversity. Once such a wood has been cleared and the tree roots removed it cannot be recreated because it takes centuries for newly planted trees to mature and for the associated flora and fauna to return – if ever.
- Alien invaders rhododendron and cherry laurel are particularly damaging invasive shrubs (appendix 6 for eradicating non-native species). Where they are well developed, they can form impenetrable thickets which shade out native species, prevent native trees from regenerating and destroy animal habitats. Snowberry and red–osier

dogwood, the latter especially along rivers, are also a problem and locally wild clematis can be invasive. Herbaceous species, e.g., giant hogweed and Himalayan balsam growing alongside rivers and streams, can also be very damaging.

- More subtle impacts on our native woods arise from indirect activities. For example, air pollution can damage delicate lichens, while fertiliser drift from adjacent farmland can alter the woodland flora. Drainage damages alluvial and other wetland woods by altering flooding regimes.
- Finally, dumping of domestic and agricultural rubbish is unfortunately common in our native woodlands, and this detracts from their natural beauty.

3.4.5 Opportunities

- Wooded areas – reduce areas accessible by animals allowing native species to colonise and reproduce.
- To increase areas of scrub in out of the way field corners or wet sites.
- To provide continuity of habitat by ensuring hedgerows, wooded areas streams etc are linked together so that species can freely move about and feed etc.
- To allow pollinator rich grassy areas to flourish adjacent to hedgerows and in difficult corners or inaccessible slopes to grow– short grass is good for thrushes and blackbirds etc., to feed on. Areas left uncut or not sprayed adjacent to hedge good as permits small mammals to move from place to place undetected.

3.4.6 Actions

- Leave wooded areas to naturally evolve. As with Cotter's Wood on the outskirts of the village, they are unlikely to have much value as commercial timber.
- Provide continuity of habitat where none exist.
- Reduce spraying as much as possible, consider strimming or using mulches where appropriate.
- Remove invasive alien species (appendix 6)

3.5 *Mark Hurley's land at The Pike, Tallow, East of Knockanore*

3.5.1 Description

Mark Hurley's farm (Grid ref: 52°02'33" N, 7°58'11" W) is mainly managed for grass-fed cattle production (figs. 1 & 26 and map 'The Hurley Farm' inserted at end of report). The property forms part of a larger farm, most of which is at another location outside of the study area. These fields are grazed for stock and cut for silage. Three habitats were recorded on the farm (table 5, appendix 3 table)

In addition, a crop of seed-producing wild bird cover plants, mainly flaxseed, oats and black mustard was planted among the grass in the most westerly field, in late 2019. These measures benefit native wild birds which are scarce both in this area and more generally on Irish farmland. During the survey (21 October 2020), good numbers of small finches (Goldfinch, Yellowhammer, Chaffinch, and others, fig. 27) were observed feeding on the seed.

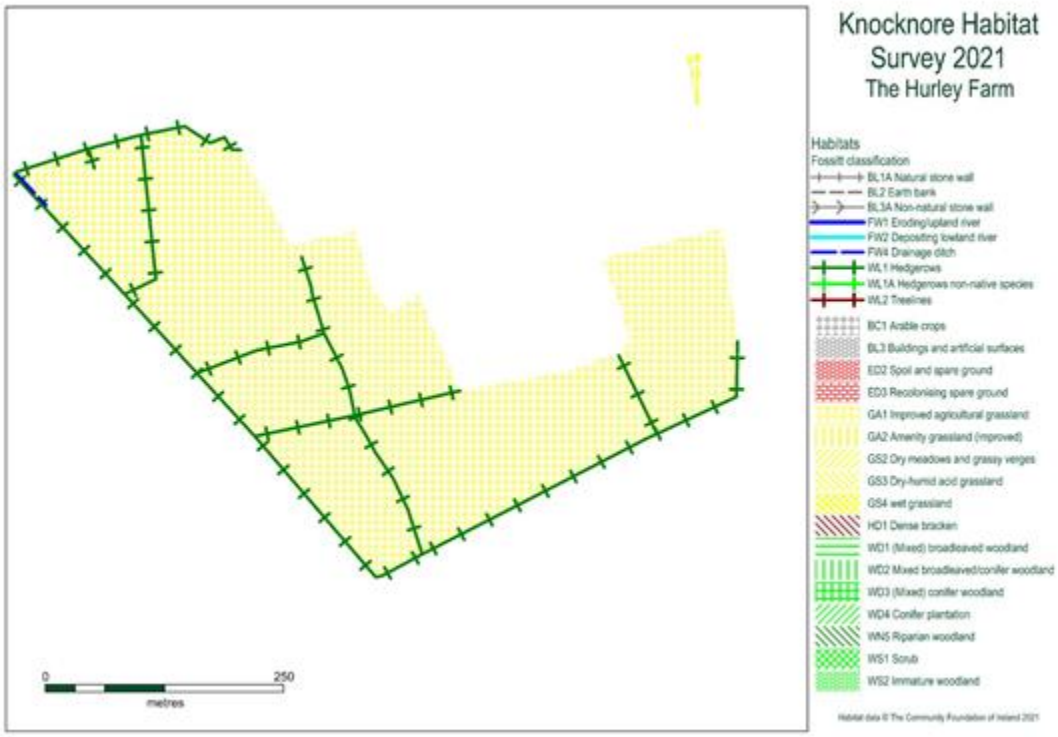

Fig. 16 Habitats on Mark Hurley's farm

Perennial ryegrass is the dominant species in these fields agricultural grassland habitat, appendix 3, table 35), but elements of semi-natural grassland can be

found in the worn areas (e.g., Around the ESB pole which the cattle use as a scratching post).

Fig. 27 Flock of mixed finches on Mark Hurley's farm

Table 5 Habitats area based (ha) and linear habitats (m) on Mark Hurley's farm

Habitat code	Habitat	Area (ha)	Length (m)
GA1	Improved agricultural grassland	14.36	
WL1	Hedgerows native species		2308.77
FW4	Drainage ditches		44.32

Some of the fields were partly flooded (fig. 28), at the time of a second visit and were being used as a resting area for at least seven snipe. A species list of the plants area can be found in appendix 3, tables 35, 36 & 37,)

3.5.2 Strengths

- Roadside hedgerows are good, dense, and biodiverse, containing some semi mature trees (appendix 3, table 36).
- Remains of natural stone-built walls.
- Some of the hedgerows on the eastern side are adjacent to forestry and they contribute to the biodiversity of the area and to continuity of habitat.

Fig. 28 Looking at wet drainage ditch on the northern end of the property

- Wet tussocky areas adjacent to drainage ditch (appendix 3, table 37), to the north of the property contain some permanent or semi-permanent water which is a valuable habitat and provides drinking for small creatures including snipe which were observed during the visits.
- Cover crop has encouraged and sustained small bird including finches and sparrow hawks.
- Retention of lovely traditional gate with stone pillars.

3.5.3 Weaknesses

- Some of the roadside hedgerows contain non-native roses Leyland cypress and apple along with the invasive species rhododendron and cherry laurel.
- Hedgerow removal leading to a fragmented habitat and a reduction of biodiversity.
- Gaps in hedgerows and poor diversity in herbaceous layer of hedgerows within property.

3.5.4 Threats

- Further loss of hedgerow will lead to less biodiversity and a reduction in shelter.
- Reduced biodiversity in herbaceous layer.
- The spreading of slurry and fertiliser poses a threat to the water quality.

3.5.5 Opportunities

- To strengthen existing hedgerows within fields.
- To remove rhododendron, Leyland cypress and cherry laurel.

3.5.6 Actions

- Fill in gaps with native woody species.
- Leave margin at base of hedgerow to grow out by leaving a meter either side of hedgerow uncut or grazed.
- Remove invasive species (appendix 6).

3 References

1. Fossitt, J. (2000) A guide to habitats in Ireland, Heritage Council, Kilkenny.
2. Scannell, Mary J.P. & Synnott, Donal M. (1987). Census Catalogue of the Flora of Ireland, second edition The Stationary Office, Department of Agriculture and Food, Dublin
3. Foulkes, N., Fuller, J., Little, D., McCourt, S. and Murphy, P. (2013). Hedgerow Appraisal System - Best Practice Guidance on Hedgerow Survey, Data Collation and Appraisal. Woodlands of Ireland, Dublin. Unpublished Report https://www.biodiversityireland.ie/wordpress/wp-content/uploads/Hedgerow_Appraisal_System.pdf
4. Knockanore: Botanically the best churchyard in Co. Waterford, P. R. Green. https://bsbi.org/wp-content/uploads/dlm_uploads/IrBotNews2006.pdf
5. https://pollinators.ie/working-together-for-biodiversity/
6. Fionn O'Nulainn Irish Examiner 'Not just squirrels that go nuts over hazel and for good reason' https://www.irishexaminer.com/property/homeandoutdoors/arid-30950651.html
7. https://www.woodlandtrust.org.uk/trees-woods-and-wildlife/british-trees/a-z-of-british-trees/hawthorn/
8. https://www.biodiversityireland.ie/practical-advice-on-managing-wildflower-meadows/
9. Marsh Fritillary Butterfly Factsheet 23/10/2021 http://www.ipcc.ie/a-to-z-peatlands/marsh-fritillary-butterfly/

Appendix 1 Blackwater River Cork/Waterford) SAC report

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

Site Name: Blackwater River (Cork/Waterford) SAC Site Code: 002170

The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and five ranges of mountains. In times of heavy rainfall, the levels can fluctuate widely by more than 12 feet on the gauge at Careysville. The peaty nature of the terrain in the upper reaches and of some of the tributaries gives the water a pronounced dark colour. The site consists of the freshwater stretches of the River Blackwater as far upstream as Ballydesmond, the tidal stretches as far as Youghal Harbour and many tributaries, the larger of which include the Licky, Bride, Flesk, Chimneyfield, Finisk, Araglin, Awbeg (Buttevant), Clyda, Glen, Allow, Dalua, Brogeen, Rathcool, Finnow, Owentaraglin and Awnaskirtaun. The portions of the Blackwater and its tributaries that fall within this SAC flow through the counties of Kerry, Cork, Limerick, Tipperary, and Waterford. Nearby towns include Rathmore, Millstreet, Kanturk, Banteer, Mallow, Buttevant, Doneraile, Castletownroche, Fermoy, Ballyduff, Rathcormac, Tallow, Lismore, Cappoquin and Youghal.

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
[1220] Perennial Vegetation of Stony Banks[1310] *Salicornia* Mud
[1330] Atlantic Salt Meadows
[1410] Mediterranean Salt Meadows[3260] Floating River Vegetation [91A0] Old Oak Woodlands
[91E0] Alluvial Forests*
[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*)

The Blackwater rises in boggy land in east Kerry, where Namurian grits and shales build the low heather-covered plateaux. Near Kanturk the plateaux enclose a basin of productive Coal Measures. On leaving the Namurian rocks the Blackwater turns eastwards along the northern slopes of the Boggeragh Mountains before entering the narrow limestone strike vale at Mallow. The valley deepens as first the Nagles Mountains and then the Knockmealdowns impinge upon it. Interesting geological features along this stretch of the Blackwater Valley include limestone cliffs and caves near the villages and small towns of Killavullen and Ballyhooly; the Killavullen caves contain fossil material from the end of the glacial period. The associated basic soils in this area support the growth of plant communities which are rare in Cork because in general the county's rocks are acidic. At Cappoquin the river suddenly turns south and cuts through high ridges of Old Red Sandstone. The Araglin valley is predominantly underlain by sandstone, with limestone occurring in the lower reaches near Fermoy.

Wet woodlands are found where river embankments have broken down and channel edges are subject to daily inundation. This is particularly evident in the steep-sided valley of the River Bride, between Cappoquin and Youghal. The river side of the embankments was often used for willow growing in the past (most recently at Cappoquin) so that the channel is lined by narrow woods of White and Almond- leaved Willow (*Salix alba* and *S. triandra*), with isolated Crack Willow (*S. fragilis*) and Osier (*S. viminalis*). Rusty Willow (*S. cinerea subsp. oleifolia*) spreads naturally into the sites and occasionally, as at Villierstown on the Blackwater and Sapperton on the Bride, forms woods with a distinctive mix of woodland and marsh plants, including Gypsywort (*Lycopus europaeus*), Guelder-rose (*Viburnum opulus*), Bittersweet (*Solanum dulcamara*) and various mosses and algae. These wet woodlands form one of the most extensive tracts of the wet woodland habitat in the country.

A small stand of Yew (*Taxus baccata*) woodland occurs within the site. This is on a limestone ridge at Dromana, near Villierstown. While there are some patches of the wood with a canopy of Yew and some very old trees, the quality is generally poor due to the dominance of non-native and invasive species such as Sycamore (*Acer pseudoplatanus*), Beech (*Fagus sylvatica*) and Douglas Fir (*Pseudotsuga menzsisii*).
However, it does have the potential to develop into a Yew dominated stand in the long term and the site should continue to be monitored.

Marshes and reedbeds cover most of the flat areas beside the rivers and often occur in mosaic with the wet woodland. Common Reed (*Phragmites australis*) is ubiquitous and is harvested for thatching. There is also much Marsh-marigold (*Caltha palustris*) and, at the edges of the reeds, the Greater and Lesser Pond-sedge (*Carex riparia* and *C. acutiformis*). Hemlock Water-dropwort (*Oenanthe crocata*), Wild Angelica (*Angelica sylvestris*), Reed Canary-grass (*Phalaris arundinacea*), Meadowsweet (*Filipendula ulmaria*), Common Nettle (*Urtica dioica*), Purple Loosestrife (*Lythrum salicaria*), Common Valerian (*Valeriana officinalis*), Water Mint (*Mentha aquatica*) and Water Forget-me-not (*Myosotis scorpioides*) are all also found.
At Banteer there are a number of hollows in the sediments of the floodplain where subsidence and subterranean drainage have created isolated wetlands, sunk below the level of the surrounding fields. The water rises and falls in these holes depending on the water table and several different communities have developed on the acidic or neutral sediments. Many of the ponds are ringed with Rusty Willow, rooted in the mineral soils but sometimes collapsed into the water. Beneath the densest stands are woodland herbs like Yellow Pimpernel (*Lysimachia nemorum*), with locally abundant Common Water-starwort (*Callitriche stagnalis*) and Marsh Ragwort (*Senecio aquaticus*). One of the depressions has Silver Birch (*Betula pendula*), Ash (*Fraxinus excelsior*), Crab Apple (*Malus sylvestris*) and a little Pedunculate Oak (*Quercus robur*) in addition to the willows.

Floating river vegetation is found along much of the freshwater stretches within the site. The species list is quite extensive, with species such as water-crowfoots, including Pond Water-crowfoot (*Ranunculus peltatus*), Canadian Pondweed (*Elodea canadensis*), pondweed species, including Broad-leaved Pondweed (*Potamogeton natans*), water-milfoil species (*Myriophyllum* spp.), Common Club-rush (*Scirpus lacustris*), water-starwort species (*Callitriche* spp.), Lesser Water-parsnip (*Berula erecta*) particularly on the Awbeg, Water-cress (*Nasturtium officinale*), Hemlock Water- dropwort, Fine-leaved Water-dropwort (*O. aquatica*), Common Duckweed (*Lemna minor*), Yellow Water-lily (*Nuphar lutea*), Unbranched Bur-reed (*Sparganium emersum*) and the moss *Fontinalis antipyretica* all occurring.

The grasslands adjacent to the rivers of the site are generally heavily improved, although liable to flooding in many places. However, fields of more species-rich wet grassland with species such as Yellow Iris (*Iris pseudacorus*), Meadowsweet, Meadow Buttercup (*Ranunculus acris*) and rushes (*Juncus* spp.) occur occasionally. Extensive fields of wet grassland also occur at Annagh

Bog on the Awbeg. These fields are dominated by Tufted hair-grass (*Deschampsia cespitosa*) and rushes.

The Blackwater Valley has a number of dry woodlands; these have mostly been managed by the estates in which they occur, frequently with the introduction of Beech and a few conifers, and sometimes of the invasive species Rhododendron (*Rhododendron ponticum*) and Cherry Laurel (*Prunus laurocerasus*). Oak woodland is well developed on sandstone about Ballinatray, with the acid oak woodland community of Holly (Ilex aquifolium), Bilberry (*Vaccinium myrtillus*), Great Wood-rush (*Luzula sylvatica*) and the ferns *Dryopteris affinis* and *D. aemula* occurring in one place. Irish Spurge (*Euphorbia hyberna*) continues eastwards on acid rocks from its headquarters to the west, but there are also many plants of richer soils, for example Wood Violet (*Viola reichenbachiana*), Goldilocks Buttercup (*Ranunculus auricomus*), Broad-leaved Helleborine *(Epipactis helleborine*) and Red Campion (*Silene dioica*). Oak woodland is also found in Rincrew, Carrigane, Glendine, Newport and Dromana.
The spread of Rhododendron is locally a problem, as is over-grazing. A few limestone rocks stand over the river in places showing traces of a less acidic woodland type with Ash, False Brome (*Brachypodium sylvaticum*) and Early-purple Orchid (*Orchis mascula*).
In the vicinity of Lismore, two deep valleys cut in Old Red Sandstone join to form the Owenashad River before flowing into the Blackwater at Lismore. These valleys retain something close to their original cover of oak with Downy Birch (*Betula pubescens*), Holly and Hazel *(Corylus avellana*) also occurring. There has been much planting of Beech (as well as some of coniferous species) among the oak on the shallower slopes and here both Rhododendron and Cherry Laurel have invaded the woodland.

The oak wood community in the Lismore and Glenmore valleys is of the classic upland type, in which some Rowan (Sorbus aucuparia) and Downy Birch occur. Honeysuckle (*Lonicera periclymenum*) and Ivy (*Hedera helix*) cover many of the trees while Great Wood-rush, Bluebell (*Hyacinthoides non-scripta*), Wood-sorrel (*Oxalis acetosella*) and, locally, Bilberry dominate the ground flora. Ferns present on the site include Hard Fern (*Blechnum spicant*), Male Fern (Dryopteris filix-mas), the buckler- ferns *D. dilatata and D. aemula*, and Lady Fern (*Athyrium felix-femina*). There are many mosses present and large species such as *Rhytidiadelphus* spp., *Polytrichum formosum*, *Mnium hornum* and *Dicranum* spp. are noticeable. The lichen flora is important and includes 'old forest' species which imply a continuity of woodland here since ancient times. Tree Lungwort (*Lobaria* spp.) is the most conspicuous and is widespread.

The Araglin valley consists predominantly of broadleaved woodland. Oak and Beech are joined by Hazel, Wild Cherry (*Prunus avium*) and Goat Willow (*Salix caprea*). The ground flora is relatively rich, with Pignut (*Conopodium majus*), Ramsons (*Allium ursinum*), Garlic Mustard (*Alliaria petiolata*) and Wild Strawberry (*Fragaria vesca*). The presence of Ivy Broomrape (*Orobanche hederae*), a local species within Ireland, suggests that the woodland, along with its attendant Ivy, is long established.

Along the lower reaches of the Awbeg River, the valley sides are generally cloaked with mixed deciduous woodland of estate origin. The dominant species is Beech, although a range of other species are also present, e.g., Sycamore, Ash and Horse- chestnut (*Aesculus hippocastanum*). In places the alien invasive species Cherry Laurel dominates the understorey. Parts of the woodlands are more semi-natural in composition, being dominated by Ash, with Hawthorn (*Crataegus monogyna*) and Spindle (*Euonymus europaea*) also present. However, the most natural areas of woodland appear to be the wet areas dominated by Alder and willows (*Salix* spp.). The ground flora of the dry woodland areas features species such as Pignut, Wood Avens (*Geum urbanum*), Ivy and Soft Shield-fern (*Polystichum setiferum*), while the ground flora of the wet woodland areas contains characteristic species such as Remote Sedge (*Carex remota*) and Opposite-leaved Golden-saxifrage (*Chrysosplenium oppositifolium*).

In places along the upper Bride, scrubby, semi-natural deciduous woodland of willow, oak and Rowan occurs, with abundant Great Wood-rush in the ground flora.

The Bunaglanna River passes down a very steep valley, flowing in a north-south direction to meet the Bride River. It flows through blanket bog to heath and then scattered woodland. The higher levels of moisture here enable a vigorous moss and fern community to flourish, along with a well-developed epiphyte community on the tree trunks and branches.

At Banteer a type of wetland occurs near the railway line which offers a complete contrast to the others. Old turf banks are colonised by Royal Fern (*Osmunda regalis*) and Eared Willow (*Salix aurita*), and between them there is a sheet of Bottle Sedge (*Carex rostrata*), Marsh Cinquefoil (*Potentilla palustris*), Bogbean (*Menyanthes trifoliata*), Marsh St. John's-wort (*Hypericum elodes*) and the mosses *Sphagnum auriculatum* and *Aulacomnium palustre*. The cover is a scraw (i.e. floating vegetation) with characteristic species like Marsh Willowherb (*Epilobium palustre*) and Early Marsh- orchid (*Dactylorhiza incarnata*).

The soil high up the Lismore valleys and in rocky places is poor in nutrients but it becomes richer where streams enter and also along the valley bottoms. In such sites Wood Speedwell (Veronica montana), Wood Anemone (*Anemone nemorosa*), Enchanter's-nightshade (*Circaea lutetiana*), Barren Strawberry (*Potentilla sterilis*) and shield-fern (*Polystichum* sp.) occur. There is some Ramsons, Three-nerved Sandwort (*Moehringia trinervia*) and Early-purple Orchid (*Orchis mascula*) locally, with Opposite-leaved Golden-saxifrage, Meadowsweet and Bugle (*Ajuga reptans*) in wet places. A stand of Hazel woodland at the base of the Glenakeeffe valley shows this community well.

The area has been subject to much tree felling in the recent past and re-sprouting stumps have given rise to areas of bushy Hazel, Holly, Rusty Willow and Downy Birch. The ground in the clearings is heathy with Heather (*Calluna vulgaris*), Slender St John's-wort (*Hypericum pulchrum*) and the occasional Broom (*Cytisus scoparius*) occurring.

The estuary and the habitats within and associated with it form a large component of the site. Very extensive areas of intertidal flats, comprised of substrates ranging from fine, silty mud to coarse sand with pebbles/stones are present. The main expanses occur at the southern end of the site, with the best examples at Kinsalebeg in Co. Waterford, and between Youghal and the main bridge north of it across the river in Co. Cork. Other areas occur along the tributaries of the Licky in east Co. Waterford, and Glendine, Newport, Bride and Killahaly Rivers in Waterford west of the Blackwater. There are also large tracts along the Tourig River in Co. Cork. There are narrow bands of intertidal flats along the main river as far north as Camphire Island. Patches of green filamentous algae (*Ulva* sp. and *Enteromorpha* sp.) occur in places, while fucoid algae are common on the more stony flats, even as high upstream as Glenassy or Coneen.

The area of saltmarsh within the site is small. The best examples occur at the mouths of the tributaries and in the townlands of Foxhole and Blackbog. Those found are generally characteristic of Atlantic salt meadows. The species list at Foxhole consists of Common Saltmarsh-grass (*Puccinellia maritima*), small amounts of Greater Sea- spurrey (*Spergularia media*), glasswort (*Salicornia* sp.), Sea Arrowgrass (*Triglochin maritima*), Annual Sea-blite (*Suaeda maritima*) and Sea Purslane (*Halimione portulacoides*) - the latter a very recent coloniser. Some Sea Aster (*Aster tripolium*) occurs, generally with Creeping Bent (*Agrostis stolonifera*). Sea Couch (*Elymus pycnanthus*) and small isolated clumps of Sea Club-rush (*Scirpus maritimus*) are also

seen. On the Tourig River additional saltmarsh species found include sea-lavenders (*Limoniun* spp.), Thrift (*Armeria maritima*), Red Fescue (*Festuca rubra*), Common Scurvygrass (Cochlearia officinalis) and Sea Plantain (*Plantago maritima).* Oraches (*Atriplex* spp.) are found on channel edges. Species such as Saltmarsh Rush (*Juncus gerardi*) and Sea Rush (*J. maritimus*) are found in places in this site also and are indicative of Mediterranean salt meadows. Areas of Salicornia mud are found at the eastern side of the townland of Foxbole above Youghal, at Blackbog, along the Tourig and Kinsalebeg esturaies.

The shingle spit at Ferrypoint supports a good example of perennial vegetation of stony banks. The spit is composed of small stones and cobbles and has a well developed and diverse flora. At the lowest part, Sea Beet (*Beta vulgaris* subsp. maritima), Curled Dock (*Rumex crispus*) and Yellow Horned-poppy (*Glaucium flavum*) occur, while at a slightly higher level Sea Mayweed (*Matricaria maritima*), Cleavers (*Galium aparine*), Rock Samphire (*Crithmum maritimum*), Sea Sandwort (*Honkenya peploides*), Spear-leaved Orache (*Atriplex prostrata*) and Babington's Orache (*A. glabriuscula*). Other species present include Sea Rocket (*Cakile maritima*), Herb-Robert (*Geranium robertianum*), Red Fescue and Kidney Vetch (*Anthyllis vulneraria*). The top of the spit is more vegetated and supports lichens and bryophytes, including *Tortula ruraliformis* and *Rhytidiadelphus squarrosus*.

The site supports several Red Data Book plant species, i.e. Starved Wood-sedge (*Carex depauperata*), Killarney Fern (*Trichomanes speciosum*), Pennyroyal (*Mentha pulegium*), Bird's-nest Orchid (*Neottia nidus-avis*), Golden Dock (*Rumex maritimus*) and Bird Cherry (*Prunus padus*). The first three of these are also protected under the Flora (Protection) Order, 2015, while the Killarney Fern is also listed on Annex II of the
E.U. Habitats Directive. The following plants, relatively rare nationally, are also found within the site: Toothwort (*Lathraea squamaria*) - associated with woodlands on the Awbeg and Blackwater; Summer Snowflake (*Leucojum aestivum*) and Flowering Rush (*Butomus umbellatus*) on the Blackwater; Common Calamint (Calamintha ascendens), Red Campion, Sand Leek (*Allium scorodoprasum*) and Wood Club-rush (*Scirpus sylvaticus*) on the Awbeg.

The site is also important for the presence of several E.U. Habitats Directive Annex II animal species, including Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey *(L. fluviatilis*), Twaite Shad (*Alosa fallax fallax*), Freshwater Pearl Mussel (Margaritifera margaritifera), Otter (*Lutra lutra*) and Salmon (*Salmo salar*). The Awbeg supports a population

of White-clawed Crayfish (*Austropotamobius pallipes*). This threatened species has been recorded from a number of locations and its remains are also frequently found in Otter spraints, particularly in the lower reaches of the river. The freshwater stretches of the Blackwater and Bride Rivers are designated salmonid rivers. The Blackwater is noted for its enormous run of salmon over the years. The river is characterised by significant pools, streams, glides, and generally, a good push of water coming through except in very low water. Spring salmon fishing can be carried out as far upstream as Fermoy and is highly regarded especially at Careysville. The Bride, main Blackwater upstream of Fermoy, and some of the tributaries are more associated with grilse fishing.

The site supports many of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger, and Irish Hare. The bat species Natterer's Bat, Daubenton's Bat, Whiskered Bat, Brown Long-eared Bat and Pipistrelle, can be seen feeding along the river, roosting under the old bridges and in old buildings.

Common Frog, a Red Data Book species that is also legally protected (Wildlife Act, 1976), occurs throughout the site. The rare bush cricket *Metrioptera roselii* (Order Orthoptera) has been recorded in the reed/willow vegetation of the river embankment on the Lower Blackwater River. The Swan Mussel (*Anodonta cygnea*), a scarce species nationally, occurs at a few sites along the freshwater stretches of the Blackwater.

Several bird species listed on Annex I of the E.U. Birds Directive are found on the site. Some use it as a staging area, others are vagrants, while others use it more regularly. Internationally important numbers of Whooper Swan (average peak 174, 1994/95-95/96) and nationally important numbers Bewick's Swan (average peak 5, 1996/97-2000/01) use the Blackwater Callows. Golden Plover occur in regionally important numbers on the Blackwater estuary (average peak 885, 1984/85-86/87) and on the River Bride (absolute maximum 2,141, 1994/95). Staging Terns visit the site annually, with >300 Sandwich Tern and >200 Arctic/Common Tern (average peak 1974-1994). The site also supports populations of the following: Red Throated Diver, Great Northern Diver, Barnacle Goose, Ruff, Wood Sandpiper and Greenland White-fronted Goose. Three breeding territories for Peregrine Falcon are known along the Blackwater Valley. This, the Awbeg and the Bride River are also thought to support at least 30 pairs of Kingfisher. Little Egret breed at the site (12 pairs in 1997, 19 pairs in 1998).

The site holds important numbers of wintering waterfowl. Both the Blackwater Callows and the Blackwater Estuary Special Protection Areas (SPAs) hold internationally important numbers of Black-tailed Godwit (average peak 847, 1994/95-95/96 on the callows, average peak 845, 1974/75-93/94 in the estuary). The Blackwater Callows also hold Wigeon (average peak 2,752), Teal (average peak 1,316), Mallard (average peak 427), Shoveler (average peak 28), Lapwing (average peak 880), Curlew (average peak 416) and Black-headed Gull (average peak 396) (counts from 1994/95-95/96). Numbers of birds using the Blackwater Estuary, given as the mean of the highest monthly maxima over 20 years (1974-94), are Shelduck (137 +10 breeding pairs), Wigeon (780), Teal (280), Mallard (320 + 10 breeding pairs), Goldeneye (11-97), Oystercatcher (340), Ringed Plover (50 + 4 breeding pairs), Grey Plover (36), Lapwing (1,680), Knot (150), Dunlin (2,293), Snipe (272), Black-tailed Godwit (845), Bar-tailed Godwit (130), Curlew (920), Redshank (340), Turnstone (130), Black-headed Gull (4,000) and Lesser Black-backed Gull (172). The greatest numbers (75%) of the wintering waterfowl of the estuary are located in the Kinsalebeg area on the east of the estuary in Co. Waterford. The remainder are concentrated along the Tourig estuary on the Co. Cork side.

The river and river margins also support many Heron, non-breeding Cormorant and Mute Swan (average peak 53, 1994/95-95/96 in the Blackwater Callows). Heron occurs all along the Bride and Blackwater Rivers: 2 or 3 pairs at Dromana Rock; approximately 25 pairs in the woodland opposite; 8 pairs at Ardsallagh Wood and around 20 pairs at Rincrew Wood have been recorded. Some of these are quite large and significant heronries. Significant numbers of Cormorant are found north of the bridge at Youghal and there are some important roosts present at Ardsallagh Wood, downstream of Strancally Castle and at the mouth of the Newport River. Of note are the high numbers of wintering Pochard (e.g. 275 individuals in 1997) found at Ballyhay quarry on the Awbeg, the best site for Pochard in Co. Cork.

Other important species found within the site include Long-eared Owl, which occurs all along the Blackwater River, and Barn Owl, a Red Data Book species, which is found in some old buildings and in Castlehyde, west of Fermoy. Reed Warbler, a scarce breeding species in Ireland, was found for the first time in the site in 1998 at two locations. It is not known whether or not this species breeds on the site, although it breeds nearby to the south of Youghal. Dipper occurs on the rivers.

Land use at the site is mainly centred on agricultural activities. The banks of much of the site and the callows, which extend almost from Fermoy to Cappoquin, are dominated by improved grasslands which are drained and heavily fertilised. These areas are grazed and used for silage production. Slurry is spread over much of this area. Arable crops are also grown. The spreading of slurry and fertiliser poses a threat to the water quality of this salmonid river and to the populations of E.U. Habitats Directive Annex II animal species within it. 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 Blackwater and its 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. Other recreational activities such as boating, golfing, and walking are also popular. Water skiing is carried out at Villierstown. Parts of Doneraile Park and Anne's Grove are included in the site: both areas are primarily managed for amenity purposes. There is some hunting of game birds and Mink within the site. Ballyhay quarry is still actively quarried for sand and gravel. Several industrial developments, which discharge into the river, border the site. 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, dredging of the upper reaches of the Awbeg, over-grazing within the woodland areas, and invasion by non-native species, for example Rhododendron and Cherry Laurel.

Overall, the River Blackwater is of considerable conservation significance for the occurrence of good examples of habitats and populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively.
Furthermore, it is of high conservation value for the populations of bird species that use it. Two Special Protection Areas, designated under the E.U. Birds Directive, are also located within the site - Blackwater Callows and Blackwater Estuary.
Additionally, the importance of the site is enhanced by the presence of a suite of uncommon plant species.

Appendix 2 Plant details for monthly investigation

Holly (fig. 29) or Tinne ᚈ the eight letter of the ogham alphabet (*Ilex aquifolium*)
Holly is a native evergreen tree that can grow up to 20 m high and live for 300 years. It is a hedgerow species, tolerant of shade and is easily spotted in late autumn by its red berries and stiff leathery green prickly leaves. As the leaves mature, they become smooth.

Holly is dioecious meaning male, and female flowers are borne on different trees. The flowers are small white and four petalled appearing from early spring to the start of summer.

Fig. 29 Common holly

Holly bark is grey, brown, and smooth apart from the areas where branches grow from which are wrinkled.

It has significant wildlife value, the flowers providing nectar for pollinators (ref. 5), including bees and bumblebees. It is the larval foodplant of the holly blue butterfly and moth species including the yellow barred brindle and holly tortrix.

The song thrush, mistle thrush, fieldfare and redwing love the berries often devouring them within a few hours. Berries are also eaten by wood mice and dormice and by deer in winter.

The prickliness of its leaves provides ideal nest sites for thrushes, robins, finches, and dunnocks, while the leaf litter is used by overwintering hedgehogs and small mammals.

Interestingly, in European folklore, holly was planted next to houses as protection from lightning, this has been qualified by scientists who found that the prickles on the leaves act as miniature lightning conductors.

Holly was sacred to the druids who told people to bring it into their homes in winter to lift the spirits.

In Christian legend holly sprang up from under feet of Christ as he walked the earth the thorny leaves and berries symbolising his suffering and his blood.

Appendix 3 Species found in the Knockanore study area

Table 6 List of all plants found in Knockanore (including mosses and liverworts), * denotes non-native

Common name	Scientific name	Irish name
Adder's-tongue	*Ophioglossum vulgatum*	Lus na teanga
Ageratum var. 'Blue Mink'	*Ageratum houstonianum*	-
Alder	*Alnus glutinosa*	Fearnóg
American willowherb	*Epilobium ciliatum*	Saileachán sráide
Annual meadow-grass	*Poa annua*	Cuise bliantúil
Ash	*Fraxinus excelsior*	Fuinseog
Autumn hawkbit	*Leontodon autumnalis*	Crág phortáin
Barren strawberry	*Potentilla sterilis*	Sútalún bréige
Bearded iris	*Iris germanica*	-
Bee orchid	*Ophrys apifera*	Magairlín na mbeach
Beech	*Fagus sylvatica*	Feá
Bell Heather	*Erica cinerea*	Fraoch cloigíneach
Bilberry	*Vaccinium myrtillus*	Fraochán
Bird's-foot trefoil	*Lotus corniculatus*	Crobh éin
Black mushroom	*Entoloma lampropus*	-
Black spleenwort	*Asplenium adiantum-nigrum*	Fionncha dubh
Blackthorn	*Prunus spinosa*	Draighean
Bluebell	*Hyacinthoides non-scripta*	Coinnle corra
Box	*Buxus sempervirens*	-
Box honeysuckle	*Lonicera nitida*	-
Bracken	*Pteridium aquilinum*	Raithneach mhór
Bramble	*Rubus fruticosus* agg.	Dris
Broad buckler-fern	*Dryopteris dilatata*	Raithneach chimera
Broadleaved dock	*Rumex obtusifolius*	Copóg shráide
Broad-leaved plantain	*Plantago major*	Crunch Phádraig
Brown fly agaric mushroom	*Amanita regalia*	-
Bugle	*Ajuga reptans*	Glasair choille
Bulbous buttercup	*Ranunculus bulbosus*	Tuile thalún
Bush vetch	*Vicia sepium*	Peasair fhiáin
Cat's-ear	*Hypochoeris radicata*	Cluas chait

Centaury	*Centaurium erythraea*	Dréimire Mhuire
Cep type mushrooms	Bolete spp.	-
Changing forget-me-not	*Myosotis discolor*	Lus míonla buí
Cleavers	*Galium aparine*	Garbhlus
Cock's-foot	*Dactylis glomerata*	Garbhfhéar
Common chickweed	*Stellaria media*	Fliodh
Common dog-violet	*Viola riviniana*	Fanaigse
Common eyebright	*Euphrasia nemorosa*	Glanrosc
Common field-speedwell	*Veronica persica*	Lus cré garraí
Common marsh-bedstraw	*Galium palustre*	Rú corraigh
Common milkwort	*Polygala vulgaris*	Lus na bhainne
Common mouse-ear chickweed	*Cerastium fontanum*	Cluas luchóige
Common ragwort	*Senecio jacobaea*	Buachalán buí
Common spotted-orchid	*Dactylorhiza fuchsii*	Nuacht bhallach
Common twayblade	*Neottia ovata*	Dédhuilleog
Common vetch	*Vicia sativa*	Peasair chapaill
Couch grass	*Elytrigia repens*	Broimfhéar
Cow parsley	*Anthriscus sylvestris*	Peirsil bhó
Crab apple	*Malus sylvestris*	Crann fia-úll
Creeping bent	*Agrostis stolonifera*	Feorann
Creeping buttercup	*Ranunculus repens*	Fearbán (reatha)
Creeping cinquefoil	*Potentilla reptans*	Cúig mhéar Mhuire
Creeping jenny	*Lysimachia nummularia*	Lus an dá phingin
Creeping thistle	*Cirsium arvense*	Feochadán reatha
Cultivated bugle	*Ajuga reptans* cvs. 'Burgundy Glow'	Glasair choille
Cut-leaved crane's-bill	*Geranium dissectum*	Crobh giobach
Cyanobacterial colonies	*Nostoc commune*	-
Daisy	*Bellis perennis*	Nóinín
Dandelion	*Taraxacum* agg.	Caisearbhán
Devil's-bit scabious	*Succisa pratensis*	Odhrach bhallach
Dog Rose	*Rosa canina*	Feirdhris
Dove's foot crane's-bill	*Geranium molle*	Crobh bog

Downy birch	*Betula pubescens*	Beith chlúmhac
Eared willow (or hybrid)	*Salix aurita*	Crann sníofa
Early forget-me-not	*Myosotis ramosissima*	Lus mionla loath
Elder	*Sambucus nigra*	Trom
Enchanter's-nightshade	*Circaea lutetiana*	Fuinseagach
Evening primrose	*Oenothera biennis*	Coinneal oíche
Fairy flax	*Linum catharticum*	Lus na mban sí
False oat-grass	*Arrhenatherum elatius*	Coirce bréige
Feather moss	*Brachythecium* spp.	-
Feather moss	*Homalothecium sericeum*	-
Field buttercup	*Ranunculus acris*	Fearbán feír
Field wood-rush	*Luzula campestris*	Giúnach coille
Figwort	*Scrophularia nodosa*	Donnlus
Flax	*Linum usitatissimum*	Líon
Flea sedge	*Carex pulicaris*	Cíb na ndreancaidí
Flowering Currant	*Ribes sanguineum*	-
Fool's water-cress	*Apium nodiflorum*	Gunna uisce
Fox-and-cubs	*Pilosella aurantiacum*	Searbh dearg
Foxglove	*Digitalis purpurea*	Lus mór
Fuchsia	*Fuchsia magellanica*	Fiúise
Garden geranium	*Pelargonium x hortorum*	-
Garden privet	*Ligustrum ovalifolium*	-
Germander speedwell	*Veronica chamaedrys*	Anuallach
Gladioli	*Gladiolus* spp.	-
Goat willow	*Salix caprea*	Sailchearnach
Goldenrod	*Solidago virgaurea*	Slat óir
Gorse	*Ulex europaeus*	Aiteann gallda
Greater bird's-foot trefoil	*Lotus pedunculatus*	Crobh éin corraigh
Grey willow	*Salix cinerea*	Saileacha liath
Grey-cushioned grimmia	*Grimmia pulvinata*	-
Ground ivy	*Glechoma hederacea*	Athair lusa
Groundsel	*Senecio vulgaris*	Grúnlas
Hairy bittercress	*Cardamine hirsuta*	Searbh-bhiolar giobach
Hairy male-fern	*Dryopteris affinis*	Raithneach ghainneach

Hard fern	*Blechnum spicant*	Raithneach Chris
Hard rush	*Juncus articulatus*	Lachán na ndamh
Hart's-tongue fern	*Asplenium scolopendrium*	Creamh na muice fia
Hawthorn	*Crataegus monogyna*	Sceach gheal
Hazel	*Corylus avellana*	Coll
Heath speedwell	*Veronica officinalis*	Lus cré
Hedge bed-straw	*Galium mollugo*	Rú fáil
Hedge bindweed	*Calystegia sepium*	Ialus fáil
Hedge woundwort	*Stachys sylvatica*	Créachtlus
Herb Robert	*Geranium robertianum*	Ruithéal rí
Himalayan balsam	*Impatiens glandulifera*	Lus na pléisce
Hoary willowherb	*Epilobium parviflorum*	Saileachán liath
Hogweed	*Heracleum sphondylium*	Feabhrán
Holly	*Ilex aquifolium*	Cuilleann
Honeysuckle	*Lonicera periclymenum*	Féithleann
Imperforate St. John's-wort	*Hypericum maculatum*	Beathnua gan smál
Irish yew	*Taxus baccata* 'Fastigata'	Iúr
Ivy	*Hedera helix*	Eidhneán
Ivy-leaved toadflax	*Cymbalaria muralis*	Buaflíon balla
Japanese knotweed	*Fallopia japonica*	Glúineach bhiorach
Knapweed	*Centaurea nigra*	Minscoth
Lace cap hydrangea	*Hydrangea macrophylla* cvs.	-
Lady fern	*Athyrium filix-femina*	Raithneach Mhuire
Lady's-mantle	*Alchemilla mollis*	-
Lady's smock	*Cardamine pratensis*	Biolar gréagáin
Larch	*Larix decidua*	-
Laurel	*Prunus laurocerasus*	Garden escapes
Lesser celandine	*Ficaria verna*	Grán arcáin
Lesser hawkweed	*Leontodon saxatilis*	Crág phortáin bheag
Lesser spearwort	*Ranunculus flammula*	Glasair léine bheag
Lesser stitchwort	*Stellaria graminea*	Tursarraing bheag
Leyland cypress	*Cupressus* x *leylandii*	-
Lily	*Lolium* hybrids	Líle
Ling	*Calluna vulgaris*	Fraoch mór

Liverwort	*Marchantia polymorpha*	-
Liverworts	*Pellia epiphylla*	-
Lobelia	*Lobelia erinus* cvs.	-
London pride	*Saxifraga x urbium*	Cabáiste mhadra rua
Maidenhair spleenwort	*Asplenium trichomanes*	Lus na selige
Marsh horsetail	*Equisetum palustre*	Scuab eich ghoirt
Meadow thistle	*Cirsium dissectum*	Feochadán móna
Meadow vetchling	*Lathyrus pratensis*	Peasairín buí
Meadowsweet	*Filipendula ulmaria*	Airgead luachra
Mouse-ear hawkweed	*Hieracium pilosella*	Searbh na muc
Navelwort	*Umbilicus rupestris*	Cornán caisil
Nettle	*Urtica dioica*	Neantóg
Nipplewort	*Lapsana communis*	Duilleog Bhríde
Norway spruce	*Picea abies*	-
Golden saxifrage	*Chrysosplenium oppositifolium*	Glóiris
Ornamental cherry	*Prunus avium* cvs.	Ornamental landscape trees
Ornamental heathers and heaths	*Erica, Daboecia* and *Calluna* hybrids	Fraoch
Ox-eye daisy	*Leucanthemum vulgare*	Noínín mór
Pansies and violas	*Viola tricolor* cvs.	Piteog
Parsley-piert	*Aphanes arvensis*	Mionán Muire
Patio, carpet roses, shrub roses	*Rosa* spp.	Róisín
Pedunculate oak	*Quercus robur*	Dair gheal lad
Pendulous sedge	*Carex pendula*	Cíb chrom
Perennial sow-thistle	*Sonchus arvensis*	Bleachtán léana
Pineapple-weed	*Matricaria disco idea*	Lun na hiothlann
Polyanthus primroses	*Polyanthus eliator* and hybrids	Sabhaircín
Polypody	*Polypodium vulgare*	Scim
Pot marigold	*Calendula officinalis*	-
Primrose	*Primula vulgaris*	Sabhaircín
Raspberry	*Rubus idaeus*	Sú crab had
Red bartsia	*Odontites verna*	Hocas tae
Red clover	*Trifolium pratense*	Seamair dhearg

Red dead-nettle	*Lamium purpureum*	Caochneantóg dhearg
Red fescue agg.	*Festuca* agg.	Feisciú
Redshank	*Persicaria maculosa*	Glúineach dhearg
Rhododendron	*Rhododendron ponticum*	Róslabhras
Ribwort plantain	*Plantago lanceolata*	Slánlus
Rosebay willowherb	*Chamaenerion angustifolium*	Lus na tine
Rowan	*Sorbus aucuparia*	Caorthann
Rustyback fern	*Ceterach officinarum*	Raithneach rua
Rye	*Secale cereale*	Segal
Scarlet pimpernel	*Anagallis arvensis*	Falcaire fiáin
Scented may-weed	*Matricaria chamomilla*	Fiogadán cumhra
Scots Pine	*Pinus sylvestris*	Péine Albanach
Selfheal	*Prunella vulgaris*	Duán ceannchosach
Silver birch	*Betula pendula*	Beith gheal
Silverweed	*Potentilla anserina*	Briosclán
Slender St John's-wort	*Hypericum pulchrum*	Beathnua Bain dann
Smooth hawk's-beard	*Crepis capillaris*	Lus cúráin mín
Snow-in-summer	*Cerastium candidissimum*	-
Soft rush	*Juncus effusus*	Geataire
Soft shield-fern	*Polystichum setiferum*	-
Soft sow-thistle	*Sonchus oleraceus*	Bleachtán min
Sorrel	*Rumex acetosa*	Samhadh bó
Spear thistle	*Cirsium vulgare*	Feochadán colgach
Spirea	*Spiraea* cvs.	-
Stitchwort	*Stellaria holostea*	Tussarraing mhór
Strict haircap moss	*Polytrichum strictum*	-
Sun spurge	*Euphorbia helioscopia*	Lus na bhfaitní
Sweet alyssum	*Lobularia maritima* cvs.	-
Sweet chestnut	*Castanea sativa*	Castán
Sweet vernal-grass	*Anthoxanthum odoratum*	Féar cumhra
Sycamore	*Acer pseudoplatanus*	Seicamóir
Tamarisk feather-moss	*Thuidium tamariscinum*	-
Thale cress	*Arabidopsis thaliana*	Tális
Thyme-leaved speedwell	*Veronica serpyllifolia*	Lus an treacha

Tormentil	*Potentilla erecta*	Néalfartach
Tufted vetch	*Vicia cracca*	Peasair na luch
Wall lettuce	*Mycelis muralis*	Leitís bhalla
Wall rue	*Asplenium ruta-muraria*	Raithneach rua
Water-cress	*Nasturtium officinale*	Biolar
Water-moss	*Fontinalis antipyretica*	-
Water-starwort	*Callitriche* agg.	-
Wavy bittercress	*Cardamine flexuosa*	Searbh-bhiolar casta
Wax begonia	*Begonia semperflorens*	-
White clover	*Trifolium repens*	Seamair bhán
Whorled mint	*Mentha x verticillata*	Mismín
Wild angelica	*Angelica sylvestris*	Gallfheabhrán
Wild marjoram	*Origanum vulgare*	Máirtín fiáin
Wild strawberry	*Fragaria vesca*	Sú talún fiáin
Winter heliotrope	*Petasites fragrans*	Plúr an gréine
Wood avens	*Geum urbanum*	Machall coille
Wood sage	*Teucrium scorodonia*	Iúr sléibhe
Woodland moss	*Eurhynchium praelongum*	-
Wood-sedge	*Carex sylvatica*	Cíb choille
Wood-sorrel	*Oxalis acetosella*	Seamsóg
Yarrow	*Achillea millefolium*	Athair thalún
Yellow flag iris	*Iris pseudacorus*	Feileastram
Yellow russula mushrooms	*Russula* spp.	-
Yorkshire-fog	*Holcus lanatus*	Féar an chinn bháin

Table 7 Knockanore Village GS2 (Dry meadows and Grassy verges); surveyed on the 17/10/2020

Common Name	**Scientific name**	**DAFOR scale**	**Notes**
Bush vetch	*Vicia sepium*	FRE	Behind An Maoilin
Cat's-ear	*Hypochoeris radicata*	ABU	Narrow strip beside old shop
Centaury	*Centaurium erythraea*	ABU	Narrow strip beside old shop

Cleavers	*Galium verum*	ABU	Recycling area
Clover	*Trifolium repens*	ABU	Narrow strip beside old shop
Cock's-foot	*Dactylis glomerata*	ABU	Meadow behind An Maoilin
Common bird's- foot-trefoil	*Lotus corniculatus*	ABU	Recycling area; behind An Maoilin
Common cats-ear	*Hypochoeris radicata*	ABU	Behind An Maoilin
Common mouse- ear	*Cerastium fontanum*	ABU	Narrow strip beside old shop; Meadow behind An Maoilin
Common ragwort	*Senecio jacobaea*	ABU	Behind An Maoilin
Common vetch	*Vicia sativa*	ABU	Narrow strip beside old shop
Creeping bent Grass	*Agrostis stolonifera*	ABU	Recycling area; Behind An Maoilin
Creeping buttercup	*Ranunculus repens*	ABU	Narrow strip beside old shop
Creeping soft- grass	*Holcus mollis*	ABU	Behind An Maoilin
Creeping thistle	*Cirsium arvense*	ABU	Narrow strip beside old shop; Behind An Maoilin
Dandelion	*Taraxacum* agg.	FRE	Recycling area; Behind An Maoilin
Dock	*Rumex obtusifolius*	FRE	Narrow strip beside old shop
Early forget-me- not	*Myosotis ramosissima*	ABU	Recycling area
Elder	*Sambucus nigra*	ABU	Narrow strip beside old shop
False oat-grass	*Arrhenatherum elatius*	ABU	Recycling area
Feather moss	*Homalothecium sericeum*	ABU	Narrow strip beside old shop
Figwort	*Scrophularia nodosum*	FRE	Narrow strip beside old shop
Goldenrod	*Solidago virgaurea*	ABU	Recycling area
Gorse	*Ulex europaeus*	ABU	Recycling area
Greater plantain	*Plantago major*	ABU	Recycling area
Grey willow	*Salic cinerea*	FRE	Narrow strip beside old shop
Hedge bindweed	*Calystegia sepium*	ABU	Recycling area
Hedge woundwort	*Stachys sylvatica*	ABU	Meadow behind An Maoilin
Herb Robert	*Geranium robertianum*	ABU	Narrow strip beside old shop
Hogweed	*Heracleum sphondylium*	FRE, ABU	Narrow strip beside old shop; Behind An Maoilin
Ivy	*Hedera helix*	ABU	Shed /Carpark/Amenity area

Knapweed	*Centaurea nigra*	FRE	Behind An Maoilin
Lady's mantle	*Alchemilla vulgaris* agg.	OCC	Shed /Carpark/Amenity' area
Nettle	*Urtica dioica*	ABU	Behind An Maoilin
Ragwort	*Senecio jacobaea*	ABU	Narrow strip beside old shop
Raspberry	*Rubus idaeus*	FRE	Behind An Maoilin
Red clover	*Trifolium rubrum*	ABU	Behind An Maoilin
Red fescue agg.	*Festuca* agg.	ABU	Shed /Carpark Amenity area
Ribwort plantain	*Plantago lanceolata*	ABU	Narrow strip beside old shop; Meadow behind An Maoilin
Rosebay willowherb	*Chamaenerion angustifolium*	ABU	Narrow strip beside old shop
Selfheal	*Prunella vulgaris*	ABU	Narrow strip beside old shop
Silverweed	*Potentilla anserina*	OCC	Shed /Carpark Amenity area
Sorrel	*Rumex acetosa*	ABU	Behind An Maoilin
Sweet vernal grass	*Anthoxanthum odoratum*	ABU	Shed /Carpark Amenity area
Tufted vetch	*Vicia cracca*	ABU	Shed /Carpark Amenity area
Wild angelica	*Angelica sylvestris*	ABU	Narrow strip beside old shop
Wild strawberry	*Fragaria vesca*	ABU	Narrow strip beside old shop
Yarrow	*Achillea millefolium*	FRE	Behind An Maoilin
Yorkshire fog	*Holcus lanatus*	ABU	Shed /Carpark Amenity area

Table 8 Knockanore Village GS3 (Dry-humid acid grassland); surveyed on the 17/10/2020

Common Name	**Scientific name**	**DAFOR scale**	**Notes**
Ash	*Fraxinus excelsior*	ABU	Shrub/trees behind the wide verge
Bent grasses	*Agrostis spp.*	ABU	
Bramble	*Rubus fruticosus* agg.	ABU	
Broad-leaved plantain	*Plantago major*	ABU	
Creeping soft grass	*Holcus mollis*	ABU	

Dock	*Rumex obtusifolius*	ABU	
False oat grass	*Arrhenatherum elatius*	ABU	
Foxglove	*Digitalis purpurea*	FRE	
Gorse	*Ulex europaeus*	ABU	Shrub/trees behind the wide verge
Grey willow	*Salix cinerea*	ABU	
Hart's-tongue	*Asplenium scolopendrium*	ABU	
Hawthorn	*Crataegus monogyna*	ABU	Shrub/trees behind the wide verge
Hogweed	*Heracleum sphondylium*	ABU	
Honeysuckle	*Lonicera periclymenum*	FRE	
Ivy	*Hedera helix*	ABU	
Meadowsweet	*Filipendula ulmaria*	ABU	
Nettle	*Urtica dioica*	ABU	
Ribwort plantain	*Plantago lanceolata*	ABU	
Scaly male-fern	*Dryopteris affinis*	FRE	
Sycamore	*Acer pseudoplatanus*	ABU	Shrub/trees behind the wide verge

Table 9 Knockanore Village WD1 Beech plantations to north (Cotter's wood) and south of village; surveyed on the 17/10/2020

Common Name	**Scientific name**	**DAFOR scale**	**Notes**
Beech	*Fagus sylvatica*	DOM	
Bramble	*Rubus fruticosus* agg.	OCC FRE	Mainly near the edge of the woodland and on some trees, but rarely near or on beech
Broad buckler-fern	*Dryopteris dilatata*	OCC	Mainly near the edge of the woodland
Broad buckler-fern	*Dryopteris dilatata*	OCC	

Cep type mushrooms	*Bolete* spp.	OCC	Mainly near the edge of the woodland
Creeping bent grass	*Agrostis stolonifera*	OCC - FRE	Mainly near the edge of the woodland
Goldenrod	*Solidago canadensis*	FRE	
Goldenrod	*Solidago canadensis*	OCC	Mainly near the edge of the woodland
Gorse	*Ulex europaeus*	OCC - ABU	On trees, stones and fallen timber
Holly	*Ilex aquifolium*	OCC- FRE	
Ivy	*Hedera helix*	OCC	Edge of woodland
Lady fern	*Athyrium filix-femina*	OCC	Mainly near the edge of the woodland
Mosses	*Polytrichum* & others	ABU	On trees, stones and fallen timber
Norway spruce	*Picea abies*	OCC	
Pedunculate oak	*Quercus robur*	OCC	About three trees from the original planting, plus volunteers
Polypody	*Polypodium vulgare*	OCC- FRE	On some trees (very few on beech), and near edge of wood
Sedges	*Carex* spp.	OCC	Mainly near the edge of the woodland
Sweet chestnut	*Castanea sativa*	RAR	Some volunteers ~30 cm high, & beech also -use to propagate new woodland?
Yellow russula mushrooms	*Russula* spp.	OCC	

Table 10 Knockanore Village WL1 (Native hedgerow), along the roadsides and in the car park/ recycling area, surveyed on the 17/10/2020.

Common Name	**Scientific name**	**DAFOR scale**	**Notes**
American willowherb	*Epilobium ciliatum*	ABU	
Ash	*Fraxinus excelsior*	ABU	Some in poor condition, mostly likely Ash Dieback
Black spleenwort	*Asplenium adiantum nigrum*	ABU	
Bramble	*Rubus fruticosus* agg.	ABU	
Broad buckler-fern	*Dryopteris dilatata*	FRE	
Cleavers	*Galium verum*	ABU	
Common ragwort	*Senecio jacobaea*	ABU	
Common vetch	*Vicia sativa*	ABU	
Creeping cinquefoil	*Potentilla reptans*	ABU	
Dandelion	*Taraxacum* agg.	ABU	
False oat-grass	*Arrhenatherum elatius*	ABU	
Foliate lichens	*Various*	ABU	
Foxglove	*Digitalis purpurea*	ABU	
Hart's-tongue	*Asplenium scolopendrium*	ABU	
Hawthorn	*Crataegus monogyna*	ABU	Old hawthorns many of which starting to decay. Lay, propagate, or replace?
Hawthorn	*Crataegus monogyna*	ABU	
Herb Robert	*Geranium robertianum*	ABU	
Hogweed	*Heracleum sphondylium*	ABU	
Holly	*Ilex aquifolium*	FRE	
Honeysuckle	*Lonicera periclymenum*	FRE	
Maidenhair spleenwort	*Asplenium trichomanes*	ABU	

Male-fern	*Dryopteris filix-mas*	ABU
Mosses	Various	ABU
Navelwort	*Umbilicus rupestris*	FRE
Nettle	*Urtica dioica*	ABU
Nipplewort	*Lapsana communis*	ABU
Polypody	*Polypodium vulgare*	ABU
Scented may-weed	*Matricaria chamomilla*	ABU
Smooth sow- thistle	*Sonchus oleraceus*	ABU
Soft Shield-fern	*Polystichum setiferum*	ABU
Stitchwort	*Stellaria holostea*	ABU
Sycamore	*Acer pseudoplatanus*	ABU
Violet	*Viola* spp.	FRE
Wild angelica	*Angelica sylvestris*	ABU
Wood avens	*Geum urbanum*	FRE
Wood sage	*Teucrium scorodonia*	FRE

Table 11 Knockanore Village BL2 (Stone breasted earth bank), which formed many of the roadside boundaries in village; surveyed on the 17/10/2020.

Common Name	**Scientific name**	**DAFOR scale**	**Notes**
American willowherb	*Epilobium ciliatum*	ABU	
Annual meadow grass	*Poa annua*	ABU	
Ash	*Fraxinus excelsior*	ABU	
Ash	*Fraxinus excelsior*	ABU	
Autumn hawkbit	*Leontodon autumnalis*	ABU	
Bird's-foot trefoil	*Lotus corniculatus*	FRE	
Black spleenwort	*Asplenium adiantum nigrum*	FRE	
Bramble	*Rubus fruticosus* agg.	ABU	
Broad buckler-fern	*Dryopteris dilatata*	FRE	

Bush vetch	*Vicia sepium*	FRE
Lady's bedstraw	*Galium verum*	ABU
Cock's-foot	*Dactylis glomerata*	ABU
Common mouse- ear chickweed	*Cerastium fontanum*	ABU
Common ragwort	*Senecio jacobaea*	ABU
Common vetch	*Vicia sativa*	ABU
Couch grass	*Elymus repens*	ABU
Cow parsley	*Anthriscus sylvestris*	ABU
Creeping bent grass	*Agrostis stolonifera*	ABU
Creeping buttercup	*Ranunculus repens*	ABU
Creeping cinquefoil	*Potentilla reptans*	FRE
Daisy	*Bellis perennis*	ABU
Dandelion	*Taraxacum* agg.	ABU
Broad leaved dock	*Rumex obtusifolius*	ABU
Dove's-foot crane's-bill	*Geranium molle*	ABU
Eared willow (or hybrid)	*Salix aurita*	ABU
Early forget-me- not	*Myosotis ramosissima*	ABU
Enchanter's- nightshade	*Circaea lutetiana*	ABU
False oat-grass	*Arrhenatherum elatius*	ABU
Figwort	*Scrophularia nodosum*	ABU
Fox and cubs	*Pilosella aurantiacum*	ABU
Foxglove	*Digitalis purpurea*	ABU
Germander speedwell	*Veronica chamaedrys*	ABU
Gorse	*Ulex europaeus*	ABU
Greater plantain	*Plantago major*	ABU
Ground ivy	*Glechoma hederacea*	ABU
Groundsel	*Senecio vulgaris*	ABU
Grey willow	*Salix cinerea*	ABU
Hairy bitter-cress	*Cardamine hirsuta*	ABU
Hart's-tongue	*Asplenium scolopendrium*	ABU
Hawthorn	*Crataegus monogyna*	ABU

Hedge woundwort	*Stachys sylvatica*	ABU
Herb Robert	*Geranium robertianum*	ABU
Hoary willowherb	*Epilobium parviflorum*	ABU
Hogweed	*Heracleum spondylitis*	ABU
Holly	*Ilex aquifolium*	FRE
Honeysuckle	*Lonicera periclymenum*	ABU
Ivy	*Hedera helix*	ABU
Ivy-leaved toadflax	*Cymbalaria muralis*	FRE
Knapweed	*Centaurea nigra*	FRE
Male-fern	*Dryopteris filix-mas*	FRE
Meadow buttercup	*Ranunculus acris*	ABU
Meadow vetchling	*Lathryus pratensis*	FRE
Mouse-eared hawkweed	*Hieracium pilosella*	ABU
Navelwort	*Umbilicus rupestris*	FRE
Nettle	*Urtica dioica*	ABU
Nipplewort	*Lapsana communis*	FRE
Pendulous sedge	*Carex pendula*	FRE
Perennial rye- grass	*Lolium perenne*	ABU
Pineapple may-weed	*Matricaria discoidea*	ABU
Polypody	*Polypodium vulgare*	ABU
Ragwort	*Senecio jacobaea*	ABU
Red bartsia	*Odontites vernus*	FRE
Red fescue agg.	*Festuca* agg.	ABU
Redshank	*Persicaria maculosa*	ABU
Ribwort plantain	*Plantago lanceolata*	ABU
Scarlet pimpernel	*Anagallis arvensis*	ABU
Scented may-weed	*Matricaria chamomilla*	FRE
Sedges	*Carex* spp.	ABU
Selfheal	*Prunella vulgaris*	ABU
Silverweed	*Potentilla anserina*	ABU
Smooth sow- thistle	*Sonchus oleraceus*	ABU
Soft shield-fern	*Polystichum setiferum*	FRE
Sow-thistle	*Sonchus oleraceus*	ABU

Spear thistle	*Cirsium vulgare*	ABU	
Stitchwort	*Stellaria holostea*	ABU	
Stitchwort	*Stellaria holostea*	ABU	
Sweet vernal-grass	*Anthoxanthum odoratum*	ABU	
Sycamore	*Acer pseudoplatanus*	ABU	
Thyme-leaved speedwell	*Veronica serpyllifolia*	FRE	
Tufted vetch	*Vicia cracca*	FRE	
Violet	*Viola* spp.	FRE	
Wall lettuce	*Mycelis muralis*	FRE	
White clover	*Trifolium repens*	ABU	
Wild angelica	*Angelica sylvestris*	ABU	
Wild rose	*Rosa canina*	OCC	
Wild strawberry	*Fragaria vesca*	ABU	
Wood avens	*Geum urbanum*	FRE	
Wood sage	*Teucrium scorodonia*	FRE	
Yarrow	*Achillea millefolium*	FRE	A lovely old, pillared gate to the south of village
Yorkshire-fog	*Holcus lanatus*	ABU	

Table 12 Knockanore Village BL1A (Stone walls) bounding the beech woodlands in the village. Surveyed on the 08/10/2020.

Common Name	**Scientific name**	**DAFOR scale**
American willowherb	*Epilobium ciliatum*	FRE
Ash	*Fraxinus excelsior*	ABU
Barren strawberry	*Potentilla sterilis*	FRE
Bell heather	*Erica cinerea*	ABU
Bilberry	*Vaccinium myrtillus*	OCC
Black spleenwort	*Asplenium adiantum nigrum*	ABU
Bramble	*Rubus fruticosus* agg.	ABU
Broad buckler-fern	*Dryopteris dilatata*	ABU
Bush vetch	*Vicia sepium*	ABU

Cleavers	*Galium verum*	ABU
Cock's-foot	*Dactylis glomerata*	ABU
Common ragwort	*Senecio jacobaea*	ABU
Common vetch	*Vicia sativa*	ABU
Cow parsley	*Anthriscus sylvestris*	ABU
Creeping Bent Grass	*Agrostis stolonifera*	ABU
Dandelion	*Taraxacum* agg.	ABU
Enchanter's- nightshade	*Circaea lutetiana*	FRE
False oat-grass	*Arrhenatherum elatius*	ABU
Foxglove	*Digitalis purpurea*	ABU
Garden privet	*Ligustrum ovalifolium*	ABU
Germander speedwell	*Veronica chamaedrys*	ABU
Goldenrod	*Solidago canadensis*	ABU
Gorse	*Ulex europaeus*	FRE
Wood-rush spp.	*Luzula* spp.	OCC
Hard fern	*Blechnum spicant*	ABU
Hart's-tongue	*Asplenium scolopendrium*	ABU
Heath speedwell	*Veronica officinalis*	ABU
Hedge bedstraw	*Galium mollugo*	FRE
Herb Robert	*Geranium robertianum*	ABU
Holly	*Ilex aquifolium*	ABU
Honeysuckle	*Lonicera periclymenum*	ABU
Ivy	*Hedera helix*	ABU
Lady Fern	*Athyrium filix-femina*	ABU
Lawson-type cypress	*Cypress* hybrid (sapling)	RAR
Maidenhair spleenwort	*Asplenium trichomanes*	ABU
Mosses (various)		ABU
Navelwort	*Umbilicus rupestris*	FRE
Nettle	*Urtica dioica*	ABU
Nipplewort	*Lapsana communis*	ABU
Perennial sow- thistle	*Sonchus arvensis*	ABU
Polypody	*Polypodium vulgare*	ABU
Primrose	*Primula vulgaris*	FRE
Red Fescue agg.	*Festuca* agg.	ABU

Ribwort plantain	*Plantago lanceolata*	ABU
Rowan	*Sorbus aucuparia*	ABU
Rye	*Secale cereale*	ABU
Scaly male-fern	*Dryopteris affinis*	ABU
Scented may-weed	*Matricaria chamomilla*	ABU
Slender St John's- wort	*Hypericum pulchrum*	ABU
Soft shield-fern	*Polystichum setiferum*	FRE
Sorrel	*Rumex acetosa*	ABU
Spear thistle	*Cirsium vulgare*	One
Stitchwort	*Stellaria holostea*	OCC
Sycamore	*Acer pseudoplatanus*	ABU
Violet	*Viola* spp.	ABU
Wild angelica	*Angelica sylvestris*	FRE
Wood avens	*Geum urbanum*	FRE
Wood sage	*Teucrium scorodonia*	FRE
Yorkshire-fog	*Holcus lanatus*	ABU

Table 13 Knockanore Churchyard GS2 (Dry meadows & grassy verges), mown grass growing between graves; surveyed on the 17/10/2020 and revisited by on the 13/08 /2021.

Common Name	**Scientific name**	**DAFOR scale**	**Notes**
Adder's tongue fern	*Ophioglossum vulgatum*	OCC	Identified by Paul Green
Bee orchid	*Ophrys apifera*	OCC	
Black mushroom	*Entoloma lampropus*	OCC	Two rings & a few isolated mushrooms
Bulbous buttercup	*Ranunculus bulbous*	OCC	
Cat's-ear	*Hypochoeris radicata*	ABU	
Changing forget-me- not	*Myosotis discolor*	OCC	
Common bird's-foot-trefoil	*Lotus corniculatus*	ABU	
Common dog-violet	*Viola riviniana*	FRE	
Common eyebright	*Euphrasia nemorosa*	FRE	

Common field- speedwell	*Veronica persica*	OCC	
Common milkwort	*Polygala vulgaris*	OCC	
Common ragwort	*Senecio jacobaea*	ABU	
Common sorrel	*Rumex acetosa*	FRE	
Common spotted- orchid	*Dactylorhiza fuchsii*	OCC	Identified by Megan Morris
Common twayblade	*Neottia ovata*	OCC	
Creeping buttercup	*Ranunculus repens*	ABU	
Creeping cinquefoil	*Potentilla reptans*	ABU	
Daisy	*Bellis perennis*	ABU	
Dandelion	*Taraxacum* agg.	ABU	
Devil's-bit Scabious	*Succisa pratensis*	FRE	
Dove's foot crane's bill	*Geranium molle*	ABU	
Fairy flax	*Linum catharticum*	OCC	
Feather moss	*Brachythecium* spp.	OCC	
Fescue grasses	*Festuca* spp.	DOM	
Flea sedge	*Carex pulicaris*	OCC	
Germander speedwell	*Veronica chamaedrys*	ABU	
Knapweed	*Centaurea nigra*	ABU	
Lady's smock	*Cardamine pratensis*	OCC	
Lawn moss	*Calliergon cuspidatum*	ABU	
Lesser celandine	*Ficaria verna*	OCC	
Lesser hawkweed	*Leontodon saxatilis*	OCC	
Meadow thistle	*Cirsium dissectum*	ABU	
Mouse-ear-hawkweed	*Hieracium pilosella*	ABU	
Ox-eye daisy	*Leucanthemum vulgare*	FRE	
Primrose	*Primula vulgaris*	OCC	
Red clover	*Trifolium pratense*	ABU	
Ribwort plantain	*Plantago lanceolata*	ABU	
Sedges	*Carex* spp.	ABU	
Selfheal	*Prunella vulgaris*	ABU	
Silverweed	*Potentilla anserina*	ABU	
Smooth hawk's-beard	*Crepis capillaris*	OCC	
Strict haircap moss	*Polytrichum strictum*	FRE	Mostly on 1 grave
Tamarisk feather-moss	*Thuidium tamariscinum*	OCC	

White clover	*Trifolium repens*	ABU
Wild angelica	*Angelica sylvestris*	ABU
Yarrow	*Achillea millefolium*	ABU

Table 14 Knockanore Churchyard BC4 (Flower beds and borders), on the graves, in planters, or in flowerbeds; surveyed on the 13/8/2020

Common Name	**Scientific name**
Lady's Mantle	*Alchemilla vulgaris* agg.
Snow-in-summer	*Cerastium candidissimum*
Bugleweed	*Ajuga reptans* 'Burgundy Glow'
Pot Marigold	*Calendula officinalis*
Garden Geranium	*Pelargonium x hortorum*
Polyanthus Primroses	*Polyanthus eliator* and hybrids
London Pride	*Saxifraga x urbium*
Ageratum Blue Mink	*Ageratum houstonianum*
Alyssum	*Lobularia maritima* cvs.
Lobelia	*Lobelia erinus* cvs.
Pansies and Violas	*Viola tricolor* cvs.
Evening Primrose	*Oenothera biennis*
Wax Begonia	*Begonia semperflorens*
Ornamental heathers and heaths	*Erica, Daboecia* and *Calluna* hybrids
Lily	*Lilium hybrid*
Tall Bearded Iris	*Iris germanica*
Gladioli	*Gladiolus* spp.
Patio roses, Carpet roses, Shrub roses, and Rambling roses.	*Rosa* spp.
Lace cap Hydrangea	*Hydrangea macrophylla* cvs.
Spirea	*Spiraea* cvs.

Table 15 Knockanore Churchyard WS1 (Scrub), on ground bounded by trees Leyland cypress surveyed on the 29/08/2020

Common Name	Scientific name	DAFOR scale	Notes
Cow Parsley	*Anthriscus sylvestris*	ABU	
Rosebay Willowherb	*Chamaenerion angustifolium*	ABU	
Hogweed	*Heracleum sphondylium*	ABU	
Imperforate St John's Wort	*Hypericum maculatum*	ABU	
Elder	*Sambucus nigra*	OCC	Occ shrubs
Oak	*Quercus robur*	OCC	Healthy sapling
Foxglove	*Digitalis purpurea*	ABU	
Hawthorn	*Crataegus monogyna*	ABU	Small shrubs
Bramble	*Rubus fruticosus*	ABU	
Cat's-ear	*Hypochoeris radicata*	ABU	
Common Ragwort	*Senecio jacobaea*	ABU	
Gorse	*Ulex europaeus*	ABU	Dom shrub
Germander Speedwell	*Veronica chamaedrys*	ABU	
Selfheal	*Prunella vulgaris*	ABU	
Thale Cress	*Arabidopsis thaliana*	ABU	
Fairy Flax	*Linum catharticum*	OCC	
Creeping Thistle	*Cirsium arvense*	ABU	
Bell Heather	*Erica cinerea*	ABU	
Ling heather	*Calluna vulgaris*	FRE	
Silverweed	*Potentilla anserina*	ABU	
American Willowherb	*Epilobium ciliatum*	ABU	
Daisy	*Bellis perennis*	ABU	
Common Eyebright	*Euphrasia nemorosa*	ABU	
Wild Angelica	*Angelica sylvestris*	ABU	

Parsley-piert	*Aphanes arvensis*	ABU	
Meadow Vetchling	*Lathyrus pratensis*	ABU	
Field Forget-me-not	*Myosotis arvensis*	ABU	
Wild Raspberry	*Rubus idaeus*	OCC	This might be a garden escape
Creeping cinquefoil	*Potentilla reptans*	ABU	
Creeping Bent Grass	*Agnostics stolonifera*	ABU	
Sweet Vernal Grass	*Anthoxanthum odoratum*	ABU	

Table 16 Knockanore Churchyard BL1A (Natural stone walls), forming parts of churchyard boundaries; surveyed on the 29/08/2020

Common Name	**Scientific name**	**DAFOR scale**	**Notes**
Polypody fern	*Polypodium vulgare*	DOM	The top of the wall needs some repair, especially by the school.
Rustyback fern	*Asplenium ceterach*	FRE	
Maidenhair spleenwort	*Asplenium trichomanes*	FRE	
Wall rue	*Asplenium ruta-muraria*	FRE	
Herb Robert	*Geranium robertianum*	ABU	
Wavy bitter-cress	*Cardamine flexuosa*	ABU	
American Willowherb	*Epilobium ciliatum*	ABU	
Annual meadow grass	*Poa annua*	ABU	
Cat's-ear	*Hypochoeris radicata*	ABU	
Thyme-leaved speedwell	*Veronica serpyllifolia*	ABU	
Red dead-nettle	*Lamium purpureum*	ABU	
Ivy	*Hedera helix*	ABU	
Groundsel	*Senecio vulgaris*	ABU	
Ragwort	*Senecio jacobaea*	ABU	
Grey-cushioned grimmia	*Grimmia pulvinata*	FRE	

Table 17 Knockanore Churchyard WL2 (Treelines), forming parts of churchyard boundary or within the churchyard; surveyed on the 29/08/2020

Common Name	**Scientific name**	**Notes**
Leyland cypress	*Cupressus* x *leylandii* (possibly var. 'Leighton Green')	As a windbreak, planted inside wall to west of churchyard
Common ash	*Fraxinus excelsior*	Monitor to see if infected by Ash dieback or remove and plant elsewhere if not infected
Irish yew	*Taxus baccata* 'Fastigata'	
Holly	*Ilex aquifolium*	

Table 18 Knockanore Churchyard ED3 (Recolonising bare ground), sprayed areas such as paths; surveyed on the 13/08/2020

Common Name	**Scientific name**	**DAFOR scale**	**Notes**
American willowherb	*Epilobium ciliatum*	ABU	
Annual meadow grass	*Poa annua*	ABU	
Bramble	*Rubus fruticosus*	ABU	
Broad-leaved plantain	*Plantago major*	ABU	
Cat's-ear	*Hypochoeris radicata*	ABU	
Common mouse-ear Chickweed	*Cerastium fontanum*	ABU	
Common ragwort	*Senecio vulgaris*	ABU	
Creeping thistle	*Cirsium arvense*	ABU	
Cut-leaved crane's-bill	*Geranium dissectum*	FRE	
Daisy	*Bellis perennis*	ABU	
Dove's-foot crane's-bill	*Geranium molle*	ABU	
Early forget-me-not	*Myosotis ramosissima*	ABU	
Figwort	*Scrophularia nodosum*	FRE	

Groundsel	*Senecio vulgaris*	ABU	
Herb Robert	*Geranium robertianum*	ABU	
Knapweed	*Centaurea nigra*	ABU	
Liverwort	*Marchantia polymorpha*	ABU	
Meadow thistle	*Cirsium dissectum*	ABU	
Nettle	*Urtica dioica*	ABU	
Nostoc commune	*Cyanobacterial colonies*	ABU	
Primrose	*Primula vulgaris*	OCC	
Red dead-nettle	*Lamium purpureum*	ABU	
Scarlet pimpernel	*Anagallis arvensis*	ABU	
Silverweed	*Potentilla anserina*	ABU	
Sow-thistle	*Sonchus oleraceus*	ABU	
Spear thistle	*Cirsium vulgare*	ABU	
Sun spurge	*Euphorbia helioscopia*	OCC	
Thale cress	*Arabidopsis thaliana*	ABU	
Wavy bitter-cress	*Cardamine flexuosa*	ABU	
Wild angelica	*Angelica sylvestris*	ABU	
Wild strawberry	*Fragaria vesca*	ABU	
Winter heliotrope	*Petasites fragrans*		Just one patch, so far, use herbicide to eradicate
American willowherb	*Epilobium ciliatum*	ABU	

Table 19 List of plant species found by Paul Green in Knockanore Churchyard

Latin name	**Common name**	
Achillea millefolium	Yarrow	
Agrostis capillaris	Common Bent	
Ajuga reptans	Bugle	
Alchemilla mollis	Garden Lady's-mantle	Not native
Anagallis arvensis	Scarlet Pimpernel	

Anemone nemorosa	Wood Anemone	
Angelica sylvestris	Wild Angelica	
Anthoxanthum odoratum	Sweet Vernal-grass	
Aphanes australis	Slender Parsley-piert	
Arabidopsis thaliana	Thale Cress	
Arrhenatherum elatius	False Oat-Grass	
Asplenium ceterach	Rustyback	Wall
Asplenium ruta-muraria	Wall-rue	Wall
Asplenium trichomanes	Maidenhair Spleenwort	Wall
Bellis perennis	Daisy	
Cardamine hirsuta	Hairy Bitter-cress	
Cardamine pratensis	Cuckooflower	
Carex caryophyllea	Spring-sedge	
Carex flacca	Glaucous Sedge	
Carex pulicaris	Flea Sedge	
Carex sylvatica	Wood-sedge	
Centaurea nigra	Common Knapweed	
Centaurium erythraea	Common Centaury	
Cerastium fontanum	Common Mouse-ear	
Cerastium glomeratum	Sticky Mouse-ear	
Cirsium arvense	Creeping Thistle	
Cirsium palustre	Marsh Thistle	
Cynosurus cristatus	Crested Dog's-tail	
Dactylis glomerata	Cock's-foot	
Dactylorhiza fuchsii	Common Spotted-orchid	
Danthonia decumbens	Heath-grass	
Epilobium brunnescens	New Zealand Willowherb	Not native
Epilobium montanum	Broad-leaved Willowherb	
Epilobium obscurum	Short-fruited Willowherb	
Epilobium parviflorum	Hoary Willowherb	
Equisetum arvense	Field Horsetail	
Euphorbia peplus	Petty Spurge	
Euphrasia agg.	Eyebright	
Festuca rubra	Red Fescue	

Ficaria verna	Lesser Celandine	
Galium saxatile	Heath Bedstraw	
Geranium dissectum	Cut-leaved Crane's-bill	
Geranium robertianum	Herb-Robert	
Hedera hibernica	Atlantic Ivy	
Heracleum sphondylium	Hogweed	
Holcus lanatus	Yorkshire-fog	
Hyacinthoides non-scripta	Bluebell	
Hypericum maculatum	Imperforate St John's-wort	
Hypericum pulchrum	Slender St John's-wort	
Hypericum tetrapterum	Square-stalked St John's-wort	
Hypochaeris radicata	Cat's-ear	
Juncus bufonius	Toad Rush	
Lathyrus pratensis	Meadow Vetchling	
Leontodon saxatilis	Lesser Hawkbit	
Lepidium didymum	Lesser Swine-cress	
Leucanthemum vulgare	Oxeye Daisy	
Linum catharticum	Fairy Flax	
Lolium perenne	Perennial Rye-grass	
Lotus corniculatus	Common Bird's-foot-trefoil	
Lotus pedunculatus	Greater Bird's-foot-trefoil	
Luzula campestris	Field Wood-rush	
Luzula multiflora	Heath Wood-rush	
Myosotis arvensis	Field Forget-me-not	
Myosotis discolor	Changing Forget-me-not	
Nardus stricta	Mat-grass	
Neottia ovata	Common Twayblade	
Ophioglossum vulgatum	Adder's-tongue	
Ophrys apifera	Bee Orchid	
Pedicularis sylvatica	Lousewort	
Pilosella officinarum	Mouse-ear-hawkweed	
Plantago lanceolata	Ribwort Plantain	
Plantago major	Greater Plantain	
Poa annua	Annual Meadow-grass	

Poa humilis	Spreading Meadow-grass	
Poa trivialis	Rough Meadow-grass	
Polygala serpyllifolia	Heath Milkwort	
Polypodium cambricum	Southern Polypody	
Potentilla anglica	Trailing Tormentil	
Potentilla anserina	Silverweed	
Potentilla erecta	Tormentil	
Potentilla sterilis	Barren Strawberry	
Primula vulgaris	Primrose	
Prunella vulgaris	Selfheal	
Ranunculus acris	Meadow Buttercup	
Ranunculus bulbosus	Bulbous Buttercup	
Ranunculus repens	Creeping Buttercup	
Rubus fruticosus agg.	Bramble	
Rubus idaeus	Raspberry	
Rumex acetosa	Common Sorrel	
Rumex crispus	Curled Dock	
Rumex obtusifolius	Broad-leaved Dock	
Sagina procumbens	Procumbent Pearlwort	
Salix cinerea subsp. oleifolia	Rusty Willow	
Scorzoneroides autumnalis	Autumn Hawkbit	
Scrophularia nodosa	Common Figwort	
Senecio jacobaea	Common Ragwort	
Senecio vulgaris	Groundsel	
Sonchus asper	Prickly Sow-thistle	
Sonchus oleraceus	Smooth Sow-thistle	
Succisa pratensis	Devil's-bit Scabious	
Taraxacum agg.	Dandelion	
Torilis japonica	Upright Hedge-parsley	
Trifolium dubium	Lesser Trefoil	
Trifolium pratense	Red Clover	
Trifolium repens	White Clover	
Ulex europaeus	Gorse	
Veronica arvensis	Wall Speedwell	

Veronica chamaedrys	Germander Speedwell	
Veronica officinalis	Heath Speedwell	
Viola riviniana	Common Dog-violet	

Table 20 Kelly's of Killeenagh, Knockanore, GS4, (Wet grassland), to the north of farm and east of the farm adjacent to scrub to; surveyed on the 08/10/2020

Common Name	**Scientific name**	**DAFOR scale**	**Notes**
Bramble	*Rubus fruticosus* agg.	ABU	
Cock's-foot	*Dactylis glomerata*	FRE	
Common sorrel	*Rumex acetosa*	FRE	
Creeping bent grass	*Agrostis stolonifera*	FRE	
Creeping buttercup	*Ranunculus repens*	FRE	
Creeping soft- grass	*Holcus mollis*	FRE	
Dandelion	*Taraxacum* agg.	FRE	
Devil's-bit scabious	*Succisa pratensis*	FRE	Food source of emerging larvae in mid-June, from eggs laid under leaf in mid-May
Broad leaved dock	*Rumex obtusifolius*	ABU	
Dryopteris dilatata	*Broad buckler-fern*	OCC	
Equisetum palustre	*Marsh Horsetail*	OCC	
Field buttercup	*Ranunculus acris*	FRE	
Fool's water-cress	*Apium nodiflorum*	FRE	
Gorse	*Ulex europaeus*	OCC	
Greater bird's-foot trefoil	*Lotus uliginosus*	OCC	
Ivy	*Hedera helix*	ABU	
Knapweed	*Centaurea nigra*	FRE	
Lesser spearwort	*Ranunculus flammula*	FRE	
Marsh bedstraw	*Galium palustre*	OCC	

Meadow thistle	*Cirsium dissectum*	ABU
Meadowsweet	*Filipendula ulmaria*	FRE
Nettle	*Urtica dioica*	ABU
Opposite-leaved golden saxifrage	*Chrysosplenium oppositifolium*	FRE
Red dead-nettle	*Lamium purpureum*	OCC
Ribwort plantain	*Plantago lanceolata*	FRE
Soft rush	*Juncus effusus*	FRE
Tormentil	*Potentilla erecta*	OCC
Water-cress	*Nasturtium officinale*	FRE
Whorled mint	*Mentha* x *verticillata*	FRE
Wild angelica	*Angelica sylvestris*	FRE
Wood sedge	*Carex sylvatica*	ABU
Yorkshire-fog	*Holcus lanatus*	ABU

Table 21 Kelly's of Killeenagh, Knockanore, GS3 (Dry-humid acid grassland), rough grassland, on the steep slope in field next to the Owenasac stream; surveyed on the 08/10/2020

Common Name	**Scientific name**	**DAFOR scale**
Stitchwort	*Stellaria holostea*	FRE
Creeping bent grass	*Agrostis stolonifera*	ABU
Knapweed	*Centaurea nigra*	ABU
Violet	*Viola* spp.	FRE
Soft rush	*Juncus effusus*	FRE
Hard rush	*Juncus articulatus*	FRE

Table 22 Knockanore WS1 (Scrub), Gorse/blackthorn scrub, grading into willow scrub, on field margin/boundary; surveyed on the 08/10/2020

Common Name	**Scientific name**	**DAFOR scale**

American willowherb	*Epilobium ciliatum*	FRE
Blackthorn	*Prunus spinosa*	FRE
Bramble	*Rubus fruticosus* agg.	ABU
Goat willow	*Salix caprea*	FRE
Gorse	*Ulex europaeus*	ABU
Grey willow	*Salix cinerea*	OCC
Hawthorn	*Crataegus monogyna*	ABU

Table 23 Kelly's of Killeenagh, Knockanore, FW1 (Eroding upland river), Owenasac river. Surveyed on the 08/10/2020

Common Name	**Scientific name**	**DAFOR scale**	**Notes**
Alder	*Altus glutinosa*	ABU	
Himalayan balsam	*Impatiens balsamifera*	ABU	Invasive, remove from stream banks
Lady fern	*Athyrium filix-femina*	FRE	
Laurel	*Prunus laurocerasus*	ABU	Also, invasive
Nettle	*Urtica dioica*	ABU	
Polypody	*Polypodium vulgare*	ABU	Growing on the trees on the bank
Soft shield-fern	*Polystichum setiferum*	FRE	Among the trees beside the stream
Water-cress	*Nasturtium officinalis*	FRE	
Wild angelica	*Angelica sylvestris*	ABU	

Table 24 Kelly's of Killeenagh, Knockanore, WN5 (Wet willow alder ash woodland) by the Owenasac, surveyed on the 08/10/20

Common name	**Scientific name**	**DAFOR scale**	**Notes**
Alder	*Altus glutinosa*	ABU	
Ash	*Fraxinus excelsior*	ABU	
Bank haircap moss	*Polytrichum formosum*	FRE	On the stream bank under trees
Beech	*Fagus sylvatica*	ABU	
Blackthorn	*Prunus spinosa*	FRE	
Bramble	*Rubus fruticosus*	ABU	
Broad buckler-fern	*Dryopteris dilatata*	FRE	
Broadleaved dock	*Rumex obtusifolius*	FRE	
Bugle	*Ajuga reptans*	FRE	
Cleavers	*Galium verum*	FRE	
Creeping bent grass	*Agrostis stolonifera*	ABU	
Creeping buttercup	*Ranunculus repens*	ABU	
Elder	*Sambucus nigra*	ABU	
Enchanter's nightshade	*Circaea lutetiana*	ABU	
Foxglove	*Digitalis purpurea*	ABU	
Germander speedwell	*Veronica chamaedrys*	FRE	
Goat willow	*Salix caprea*	FRE	
Gorse	*Ulex europaeus*	FRE	
Grey willow	*Salix cinerea*	OCC	
Hawthorn	*Crataegus monogyna*	ABU	
Hazel	*Corylus avellana*	ABU	Nice big, coppiced hazels
Herb Robert	*Geranium robertianum*	OCC	
Himalayan balsam	*Impatiens balsamifera*	ABU	Invasive

Holly	*Ilex aquifolium*	FRE	
Honeysuckle	*Lonicera peiclymenum*	FRE	
Ivy	*Hedera helix*	OCC	
Lady fern	*Athyrium filix-femina*	FRE	
Larch	*Larix decidua*	FRE	
Liverwort	*Pellia epiphylla*	OCC	On the stream bank under trees
Male-fern	*Dryopteris filix-mas*	OCC	
Navelwort	*Umbilicus rupestris*	FRE	
Nettle	*Urtica dioica*	ABU	
Ornamental cherry	*Prunus avium cultivars*	FRE	These are mature, and very beautiful.
Polypody	*Polypodium vulgare*	FRE	
Primrose	*Primula vulgaris*	ABU	
Rowan	*Sorbus aucuparia*	FRE	
Soft Shield-fern	*Polystichum setiferum*	FRE	
Stitchwort	*Stellaria holostea*	FRE	
Sycamore	*Acer pseudoplatanus*	FRE	
Tamarisk Feather- moss	*Thuidium tamariscinum*	OCC	
Water-cress	*Nasturtium officials*	ABU	
Water-moss	*Fontinalis antipyretica*	FRE	
Wild angelica	*Angelica sylvestris*	ABU	
Wood avens	*Geum urbanum*	FRE	

Table 25 Kelly's of Killeenagh, Knockanore, WL1 (Native hedgerow), side 1 where we made a detailed 30m hedgerow survey; surveyed on the 08/10/2020

Common Name	**Scientific name**	**DAFOR scale**	**Notes**
Ash	*Fraxinus excelsior*	ABU	

Bracken	*Pteridium aquilinum*	FRE	A hedgerow at right angles to the previous one, dividing fields
Bramble	*Rubus fruticosus* agg.	ABU	Field division hedge
Cock's-foot	*Dactylis glomerata*	ABU	
Common ragwort	*Senecio jacobaea*	ABU	
Common sorrel	*Rumex acetosa*	FRE	
Creeping bent-grass	*Agrostis stolonifera*	ABU	
Creeping soft-grass	*Holcus mollis*	ABU	
Creeping thistle	*Cirsium arvense*	ABU	
Dandelion	*Taraxacum* agg.	ABU	
Dog rose	*Rosa canina*	FRE	
Elder	*Sambucus nigra*	FRE	
False oat-grass	*Arrhenatherum elatus*	ABU	
Gorse	*Ulex europaeus*	ABU	
Hawthorn	*Crataegus monogyna*	FRE	
Hedge woundwort	*Stachys sylvatica*	FRE	
Himalayan balsam	*Impatiens balsamifera*	FRE	Invasive alien
Holly	*Ilex aquifolium*	ABU	
Honeysuckle	*Lonicera peiclymenum*	ABU	
Ivy	*Hedera helix*	ABU	
Meadow thistle	*Cirsium dissectum*	FRE	
Scaly male-fern	*Dryopteris affinis*	FRE	
Silver birch	*Betula pendula*	FRE	Several good specimens
Soft shield-fern	*Polystichum setiferum*	FRE	
Wild angelica	*Angelica sylvestris*	FRE	
Wood sage	*Teucrium scorodonia*	FRE	

Table 26 Kelly's of Killeenagh, Knockanore, WL1 (Native hedgerow), side 2 of detailed 30m hedgerow survey; surveyed on the 08/10/2020

Common name	**Scientific name**	**DAFOR scale**	**Notes**
Ash	*Fraxinus excelsior*	ABU	Field division hedge
Bird's-foot Trefoil	*Lotus corniculatus*	ABU	Hedge against runs east-west
Bramble	*Rubus fruticosus* agg.	ABU	
Cock's-foot	*Dactylis glomerata*	ABU	
Common Mouse- ear Chickweed	*Cerastium fontanum*	ABU	
Common ragwort	*Senecio jacobaea*	ABU	
Common sorrel	*Rumex acetosa*	FRE	
Creeping bent-grass	*Agrostis stolonifera*	ABU	
Creeping soft- grass	*Holcus mollis*	ABU	
Creeping thistle	*Cirsium arvense*	ABU	
Dandelion	*Taraxacum* agg.	ABU	
Dog rose	*Rosa canina*	FRE	
Gorse	*Ulex europaeus*	ABU	
Hedge woundwort	*Stachys sylvatica*	FRE	
Himalayan balsam	*Impatiens balsamifera*	FRE	
Ivy	*Hedera helix*	ABU	
Meadow thistle	*Cirsium dissectum*	ABU	
Mouse-eared hawkweed	*Pilosella officinarum*	FRE	
Ribwort plantain	*Plantago lanceolata*	ABU	
Silver birch	*Betula pendula*	FRE	
Wild angelica	*Angelica sylvestris*	FRE	
Wood sage	*Teucrium scorodonia*	FRE	
Yarrow	*Achillea millefolium*	OCC	

Table 27 Kelly's of Killeenagh, Knockanore, WL1 (Native hedgerow), growing elsewhere on farm; some of which have potential as seed for propagation; surveyed on the 08/10/2020

Common name	*Scientific name*	**DAFOR scale**	**Notes**
Ash	*Fraxinus excelsior*	ABU	
Bird's-foot trefoil	*Lotus corniculatus*	FRE	
Blackthorn	*Prunus spinosa*	FRE	Lovely old bushes, with a good crop of sloes. Diverse understory.
Bramble	*Rubus fruticosus* agg.	ABU	
Broad buckler-fern	*Dryopteris dilatata*	FRE	
Bush vetch	*Vicia sepium*	FRE	
Cock's-foot	*Dactylis glomerata*	FRE	
Common mouse- ear chickweed	*Cerastium fontanum*	ABU	
Common ragwort	*Senecio jacobaea*	FRE	
Creeping bent grass	*Agrostis stolonifera*	ABU	
Creeping buttercup	*Ranunculus repens*	ABU	
Creeping thistle	*Cirsium arvense*	ABU	
Elder	*Sambucus nigra*	FRE	
False oat-grass	*Arrhenatherum elatus*	ABU	
Foxglove	*Digitalis purpurea*	FRE	
Germander speedwell	*Veronica chamaedrys*	FRE	
Gorse	*Ulex europaeus*	ABU	
Grey willow	*Salic cinerea*	ABU	
Hawthorn	*Crataegus monogyna*	ABU	Well-grown, might benefit from laying or topping to thicken the hedge.
Hedge bedstraw	*Galium mollugo*	FRE	
Holly	*Ilex aquifolium*	FRE	

Honeysuckle	*Lonicera periclymenum*	FRE
Ivy	*Hedera helix*	ABU
Marsh bedstraw	*Galium palustre*	FRE
Meadow thistle	*Cirsium dissectum*	ABU
Nettle	*Urtica dioica*	ABU
Ribwort plantain	*Plantago lanceolata*	ABU
Rosebay willowherb	*Chamaenerion angustifolium*	ABU
Scaly male-fern	*Dryopteris affinis*	FRE
Soft shield-fern	*Polystichum setiferum*	FRE
Wild marjoram	*Origanum vulgare*	OCC
Wood-sorrel	*Oxalis acetosella*	OCC
Yarrow	*Achillea millefolium*	FRE

Table 28 Michael and Maura Smith's farm, Coolbeggan East, Knockanore, WL1 (native hedgerow) dominating earth bank on southern field boundary; surveyed on the 29/08/2020

Common name	**Scientific name**	**DAFOR scale**	**Notes**
American willowherb	*Epilobium ciliatum*	ABU	
Ash	*Fraxinus excelsior*	ABU	
Beech	*Fagus sylvatica*	FRE	
Blackthorn	*Prunus spinosa*	ABU	
Box honeysuckle	*Lonicera nitida*	OCC	
Bracken	*Pteridium aquilinum*	ABU	
Bramble	*Rubus fruticosus* agg.	ABU	
Broad buckler-fern	*Dryopteris dilatata*	OCC	
Broadleaved dock	*Rumex obtusifolius*	ABU	
Cat's-ear	*Hypochaeris radicata*	ABU	
Cleavers	*Galium verum*	ABU	
Common ragwort	*Senecio jacobaea*	ABU	
Creeping buttercup	*Ranunculus repens*	ABU	
Creeping jenny	*Lysimachia nummularia*	OCC	

Elder	*Sambucus nigra*	ABU	
Foxglove	*Digitalis purpurea*	ABU	
Great willowherb	*Epilobium hirsutum*	ABU	
Grey willow	*Salix cinerea*	ABU	
Hairy male-fern	*Dryopteris affinis*	OCC	
Hart's-tongue	*Asplenium scolopendrium*	ABU	
Hawthorn	*Crataegus monogyna*	ABU	
Herb bennet	*Germ urbanum*	OCC	
Herb Robert	*Geranium robertianum*	ABU	
Hogweed	*Heracleum sphondylium*	ABU	
Holly	*Ilex aquifolium*	ABU	
Honeysuckle	*Lonicera peiclymenum*	OCC	
Imperforate St. John's-wort	*Hypericum maculatum*	ABU	
Ivy	*Hedera helix*	ABU	
Japanese knotweed	*Fallopia japonica*		Opposite side of road on bend just below main farm, invasive, remove by spraying
Lady fern	*Athyrium filix-femina*	OCC	
Male-fern	*Dryopteris filix-mas*	ABU	
Navelwort	*Umbilicus rupestris*	OCC	
Nettle	*Urtica dioica*	ABU	
Nipplewort	*Lapsana communis*	OCC	
Opposite-leaved golden saxifrage	*Chrysosplenium oppositifolium*	OCC	
Polypody	*Polypodium vulgare*	ABU	
Primrose	*Primula vulgaris*	OCC	
Perennial ryegrass	*Lolium perenne*	ABU	
Silverweed	*Potentilla anserina*	ABU	
Fescue spp.	*Festuca* spp.		
Meadow grass	*Poa* spp.		
Soft Shield-fern	*Polystichum setiferum*	OCC	
Spear thistle	*Cirsium vulgare*	ABU	
Violet	*Viola* spp.	OCC	

Wild angelica	*Angelica sylvestris*	ABU	
Wood sage	*Teucrium scorodonia*	OCC	

Table 29 Michael and Maura Smith's farm, Coolbeggan East, Knockanore, WL1 (native hedgerow) continuation from hedgerow in table 28 above and used for the 2nd detailed hedgerow survey; surveyed 29/08/2020

Common name	**Scientific name**	**DAFOR scale**	**Notes**
American willowherb	*Epilobium ciliatum*	OCC	WL1 sprayed repeatedly with weed killer, exposing soil from between stones to erode.
Ash	*Fraxinus excelsior*	ABU	
Blackthorn	*Prunus spinosa*	ABU	
Bracken	*Pteridium aquilinum*	ABU	
Bramble	*Rubus fruticosus* agg.		
Cow parsley	*Anthriscus sylvestris*	OCC	
Creeping cinquefoil	*Potentilla reptans*	OCC	
Elder	*Sambucus nigra*	ABU	
Figwort	*Scrophularia nodosum*	OCC	
Gorse	*Ulex europaeus*	ABU	
Ground ivy	*Glechoma hederacea*	ABU	
Hart's-tongue Fern	*Phyllitis scolopendrium*	ABU	
Hawthorn	*Crataegus monogyna*	ABU	
Hazel	*Corylus avellana*	FRE	
Himalayan balsam	*Impatiens balsamifera*	ABU	Invasive, removal by hand, before seed ripen.
Holly	*Ilex aquifolium*	ABU	
Imperforate St. John's-wort	*Hypericum maculatum*	ABU	
Ivy	*Hedera helix*	ABU	

Lesser stitchwort	*Stellaria graminea*	OCC	
Nettle	*Urtica dioica*	ABU	
Rosebay willowherb	*Chamaenerion angustifolium*	ABU	
Sycamore	*Acre pseudoplatanus*	ABU	
Violet	*Viola* spp.	OCC	
Wood sage	*Teucrium scorodonia*	OCC	

Table 30 Michael and Maura Smith's farm, Coolbeggan East, Knockanore, FW1 (drainage ditch) along roadside next to hedgerow that borders southern field; surveyed on the 29/08/2020

Common name	**Scientific name**	**DAFOR scale**	**Notes**
Bramble	*Rubus fruticosus* agg.	ABU	
Common valerian	*Valeriana officinalis*	OCC	
Creeping buttercup	*Ranunculus repens*	ABU	Diminishing to a wet roadside ditch, again
Elder	*Sambucus nigra*	ABU	
Fool's Water-cress	*Apium nodiflorum*	ABU	Wet ditch beside road
Hairy male-fern	*Dryopteris affinis*	ABU	Roadside ditch
Himalayan balsam	*Impatiens balsamifera*	ABU	Invasive, remove by hand before seeds ripen
Ivy	*Hedera helix*	ABU	
Nettle	*Urtica dioica*	ABU	Roadside ditch
Redshank	*Persicaria maculosa*	ABU	
Soft rush	*Juncus effusus*	ABU	
Wild angelica	*Angelica sylvestris*	ABU	

Table 31 Michael and Maura Smith's farm, Coolbeggan East, Knockanore, WD4 (conifer planation), adjacent to road at south of farm; surveyed on the 29/08/2020

Common name	**Scientific name**	**DAFOR scale**	**Notes**

Bracken	*Pteridium aquilinum*	ABU	
Bramble	*Rubus fruticosus* agg.	ABU	
Broad Buckler-fern	*Dryopteris dilatata*	ABU	
Hawthorn	*Crataegus monogyna*	ABU	
Holly	*Ilex aquifolium*	ABU	
Ivy	*Hedera helix*	ABU	
Norway Spruce	*Picea abies*	ABU	Small patch of dense canopy woodland, difficult to access

Table 32 Michael and Maura Smith's farm, Coolbeggan East, Knockanore, WD2 (Mixed broadleaved conifer woodland), small area in south-east corner of farm; surveyed on the 29/08/2020

Common name	**Scientific name**	**DAFOR scale**	**Notes**
Norway Spruce	*Picea abies*	FRE	
Fuchsia	*Fuchsia magellanica*	FRE	
Ivy	*Hedera helix*	ABU	Dominant ground floor species
Elder	*Sambucus nigra*	ABU	
Scots Pine	*Pinus sylvestris*	FRE	
Beech	*Fagus sylvatica*	ABU	
Sycamore	*Acer pseudoplatanus*	OCC	
Grey Willow	*Salix cinerea*	ABU	

Table 33 Michael and Maura Smith's farm, Coolbeggan East, Knockanore, WS1 (scrub), next to southern boundary on slope above stream; ssurveyed on the 29/08/2020

Common name	**Scientific name**	**DAFOR scale**	**Notes**
Ash	*Fraxinus excelsior*	ABU	Evidence of red squirrel activity.
Bluebell	*Hyacinthoides non- scripta*	ABU	Locally scarce
Bramble	*Rubus fruticosus* agg.	ABU	

Brown Fly Agaric mushroom	*Amanita regalia*	ABU	
Crab apple	*Malus sylvestris*	One	A single, old tree, perhaps use to repopulate other areas.
Creeping jenny	*Lysimachia nummularia*	ABU	
Gorse	*Ulex europaeus*	ABU	
Hazel	*Corylus avellana*	ABU	Hazel (some nut- bearing) with a good range of fungi.
Meadowsweet	*Filipendula ulmaria*	ABU	
Sycamore	*Acer pseudoplatanus*	ABU	
Wood sage	*Teucrium scorodonia*	ABU	

Table 34 Michael and Maura Smith's farm, Coolbeggan East, Knockanore, WN5 (Riparian woodland), next to southern boundary on slope above stream; surveyed on the 29/08/2020

Common name	**Scientific name**	**DAFOR scale**	**Notes**
Bracken	*Pteridium aquilinum*	OCC	
Downy birch	*Betula pubescens*	ABU	Evidence of old worked stone here, the remains of an old lime kiln
Fool's Water-cress	*Apium nodiflorum*	OCC	
Gorse	*Ulex europaeus*	OCC	
Grey willow	*Salic cinerea*	ABU	Small area of willow-dominated woodland, used as a dumping ground (C & D waste).
Ivy	*Hedera helix*	OCC	
Water-starwort	*Callitriche* agg.	OCC	A permanent pool at the confluence of two tiny streams/drainage ditches.

Table 35 Mark Hurley's farm, The Pike, Knockanore, GA1 (Improved agricultural grassland); surveyed on the 21/10/2021

Common name	**Scientific name**	**DAFOR scale**	**Notes**
Annual Meadow-grass	*Poa annua*	ABU	
Bird's-foot Trefoil	*Lotus corniculatus*	FRE	Finch feed mix
Broadleaved dock	*Rumex obtusifolius*	ABU	
Broad-leaved Plantain	*Plantago major*	FRE	
Cat's-ear	*Hypochoeris radicata*	FRE	Finch feed mix
Common chickweed	*Stellaria media*	ABU	
Creeping buttercup	*Ranunculus repens*	ABU	
Creeping thistle	*Cirsium arvense*	ABU	
Daisy	*Bellis perennis*	ABU	
Dandelion	*Taraxacum* agg.	ABU	
Fat-hen	*Chenopodium album*	FRE	Finch feed mix
Flax	*Linum usitatissimum*	OCC	Finch feed mix
Germander speedwell	*Veronica chamaedrys*	ABU	
Hairy bitter-cress	*Cardamine hirsuta*	ABU	
Oats	*Avena sativa*	FRE	Finch feed mix
Perennial rye-grass	*Lolium perenne*	DOM	
Red clover	*Trifolium pratense*	FRE	Finch feed mix
Redleg	*Persicaria maculosa*	FRE	Finch feed mix
Ribwort plantain	*Plantago lanceolata*	ABU	
Silverweed	*Potentilla anserina*	ABU	
Sow-thistle	*Sonchus oleraceus*	OCC	
White clover	*Trifolium repens*	ABU	

Table 36 Mark Hurley's farm, The Pike, Knockanore, WL1, (Native hedgerow), on stone breasted bank along road and bordering some of fields; surveyed on the 21/10/2021; majority of non-native species adjacent to roadside are an indication of previous habitation

Common name	**Scientific name**	**DAFOR scale**	**Notes**
Apple	*Malus spp.*	Two	Crab apple/domestic hybrid.
Bird's-foot Trefoil	*Lotus corniculatus*	OCC	
Blackthorn	*Prunus spinosa*	FRE	
Bramble	*Rubus fruticosus*	ABU	
Broadleaved dock	*Rumex obtusifolius*	ABU	
Bush vetch	*Vicia sepium*	FRE	
Cat's-ear	*Hypochoeris radicata*	FRE	
Cherry laurel	*Prunus laurocerasus*	OCC	Garden escape
Common box	*Buxus sempervirens*	OCC	Garden escape
Common Dog-violet	*Viola riviniana*	FRE	
Common ragwort	*Senecio jacobaea*	ABU	
Common sorrel	*Rumex acetosa*	FRE	
Common vetch	*Vicia sativa*	FRE	
Creeping thistle	*Cirsium arvense*	ABU	
Daisy	*Bellis perennis*	ABU	
Elder	*Sambucus nigra*	FRE	
Figwort	*Scrophularia nodosum*	OCC	
Flowering currant	*Ribes sanguineum*	OCC	Garden escape
Foxglove	*Digitalis purpurea*	ABU	
Gorse	*Ulex europaeus*	ABU	
Grey willow	*Salic cinerea*	FRE	
Hart's-tongue	*Asplenium scolopendrium*	OCC	
Hawthorn	*Crataegus monogyna*	ABU	
Herb Robert	*Geranium robertianum*	FRE	Banks are protected by electric fence, allowing more diversity
Hogweed	*Heracleum spondylitis*	ABU	
Honeysuckle	*Lonicera periclymenum*	FRE	
Ivy	*Hedera helix*	ABU	

Japanese rose	*Rosa rugosa*	OCC	Garden escape
Leyland cypress	*Cupressus* x *leylandii*	OCC	
Meadow thistle	*Cirsium dissectum*	ABU	
Nettle	*Urtica dioica*	ABU	
Polypody	*Polypodium vulgare*	FRE	Growing on hawthorn
Primrose	*Primula vulgaris*	OCC	
Rhododendron	*Rhododendron ponticum*	OCC	Invasive alien
Ribwort plantain	*Plantago lanceolata*	ABU	
Selfheal	*Prunella vulgaris*	FRE	
Silverweed	*Potentilla anserina*	FRE	
Smooth rush	*Juncus effusus*	ABU	
Sycamore	*Acer pseudoplatanus*	ABU	One fairly big tree, and a few seedlings
Wild angelica	*Angelica sylvestris*	ABU	
Woodland moss	*Eurhynchium praelon*		

Table 37 Mark Hurley's farm, The Pike, Knockanore, FW4 (Drainage ditch) which was flooded & fenced off when surveyed; surveyed on the 21/10/2021

Common name	**Scientific name**	**DAFOR scale**
Bramble	*Rubus fruticosus* agg.	ABU
Common vetch	*Vicia sativa*	FRE
Creeping bent grass	*Agrostis stolonifera*	FRE
Creeping buttercup	*Ranunculus repens*	ABU
Foxglove	*Digitalis purpurea*	FRE
Gorse	*Ulex europaeus*	FRE
Greater bird's-foot trefoil	*Lotus uliginosus*	OCC
Hawthorn	*Crataegus monogyna*	FRE
Ivy	*Hedera helix*	ABU
Lady fern	*Athyrium filix-femina*	OCC
Meadow thistle	*Cirsium dissectum*	ABU
Nettle	*Urtica dioica*	FRE
Purple loosestrife	*Lythrum salicaria*	OCC
Scaly male-fern	*Dryopteris affinis*	FRE

Violet	*Viola* spp.	FRE
Wild angelica	*Angelica sylvestris*	FRE
Yorkshire-fog	*Holcus lanatus*	FRE

Table 38 Record of fauna identified in Knockanore during survey

Common name	**Scientific name**	**DAFOR scale**	**Notes**
Blackbird	*Turdus merula*	ABU	Rough grassland
Buzzard	*Buteo buteo*	OCC	Calling, overhead
Cabbage White Butterfly	*Pieris rapae*		Flying over the area
Common Blue Butterfly	*Polyommatus icarus*	ABU	Flying mostly over WS1 in, Churchyard.
Fox	*Vulpes vulpes*		
Garden Snail	*Helix aspera*	OCC	On the turf over growing some of the graves to the south
Rabbit	*Oryctolagus cuniculus*		Abundant droppings present
Red Admiral	*Vanessa atalanta*	OCC	
Red Squirrel	*Sciurus vulgaris*		
Robin	*Erithacus rubecula*	OCC	Rough grassland
Rooks	*Corvus frugilegus*	ABU	Rough grassland
Small tortoiseshell butterfly	*Aglais urticaria*	ABU	
Goldfinch,	*Carduelis carduelis*		
Yellowhammer	*Emberiza citrinella*		
Chaffinch	*Fringilla coelebs*		

Appendix 4 Dates that surveying took place in Knockanore

July	21st 2020
August	13th 2020
August	29th 2020
September	17th 2020

October	08th 2020
October	21st 2020
March	08th 2021
June	18th 2021

Appendix 5 Generic Guidelines for BAPS

1 How to identify a good place for biodiversity?

As biodiversity is much reduced due to development 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.

In general, you are looking for non-intensively managed fields, thick hedgerows with a bank, drainage ditches beside hedgerows and if you are very lucky a stream, an area covered in scrub or woodland. In these areas you will find the last remaining reservoirs of your local biodiversity. In general, the age of these habitats will be a good guide to their value. To find out if you have any old habitats consult the Ordnance Survey website (https://osi.ie) and click on map viewer on the home page.

When the map opens zoom into the location you are interested in. Then select base information and mapping from drop down menu on the top left. Choose the first edition Ordnance Survey map around the 1830's and 1840's. This is the earliest and best representation of biodiversity in the country. If woodlands, wetlands, rocky places, or hedgerows are shown on this map and they are still present they will be of current biodiversity interest. The general tree species in woodlands will be distinguished whether conifers or broadleaves. Conifers have a spiky outline. Scrub symbol will be different to trees.

The other mapping of value to the public is that produced by 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 etc. 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 nearby areas of biodiversity interest, then click on Protected Areas. SAC's (Special areas of Conservation) and SPA's (Special Protected Areas) are of international importance as they have habitats and species protected under EU legislation. NHA's are 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 find out more details about the protected area open 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 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 will provide very specific (and sometimes slightly technical) information about the types of important areas (habitats) and species found at the site.

Free Resources

NGO's BirdWatch Ireland, Irish Wildlife Trust, IPCC

What's app groups i.e., Community Wetlands Forum

Heritage in Schools

Gardening for biodiversity booklet

https://laois.ie/wp-content/uploads/Garden-Wildlife-Booklet-WEB-17MB.pdf

LA (Heritage and Biodiversity Officers)

or PPn'slcdc@dublincity.ie

Facebook pages developed by local heritage officers e.g., Facebook page for Offaly Heritage has numerous videos about native plants produced by John Feehan.

Heritage in Schools Short videos

See that featuring Nessa Darcy (insects) Gordon d'Arcy artist (drawing birds)

Marsh Fritillary Butterfly Factsheet ref. 9)

http://www.ipcc.ie/a-to-z-peatlands/marsh-fritillary-butterfly/

Financial resources for works

Leader companies' funds Management Plans for community owned sites which could have biodiversity value

Heritage Council Community Grants Scheme (for surveys and publications)

Community Foundations

NPWS (but principally for designated sites)

Company sponsorship Coca Cola

2 Why plant native trees and shrubs?

Native is broadly speaking a species which arrived naturally in the country in comparison to a species which has been introduced deliberately by people.

The status of a plant and animal affects the protection given to them by legislation. Rabbits are not given any protection under the Wildlife Acts as it is not a native species (they arrived with the Normans). Only red deer are protected not any other deer species.

The distinction between native and non-native is not always clear cut as animals and plants may also arrive naturally in the country through accidental introductions.

Why promote native species of plants and animals?

- Native species are generally 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.
- By establishing them in those areas there is a greater chance they will survive and thrive.

3 Wildflower meadows: the natural way (ref.8)

Almost all plants produce flowers. The ones which need to attract pollinators use a lot of strategies to be seen or heard or even smelt. These are the plants which people notice and prize and want to have in their gardens. It is tempting to buy wildflower meadow seed but there are many reasons why this is not a good idea. Seed in those packets may not come from Ireland. They may include species which have become extinct or never grew in the locality where it is now being sown. This is sometimes known as "forging nature's signature'.

Because fertilizer has been used regularly in pastures species which produce dramatic flowers are now outnumbered by grasses. If you reduce the nutrient value of soil, you will reverse that trend. This is how this can be done.

Cut your lawn early in spring when plants start to grow after the winter. Remove all the cuttings. By cutting early you will stop the rapid growth of the vigorous grasses. By removing cuttings, you will reduce the fertility of the soil as cuttings decay and act as a fertilizer. Cut

again in August September when all species have flowered and also remove the cuttings. If you do this consistently eventually grass diversity will decrease and a more diverse colourful collection of plants will appear in your lawn.

If you want to make more effort you could plant yellow rattle Rhinanthus in your lawn as this colourful species is parasitic on grasses. So, as well as introducing a colourful forb the cover of grasses will decline. If you want more colour in your lawn, early put in native bulbs.

https://www.biodiversityireland.ie/practical-advice-on-managing-wildflower-meadows/

4 Establish biodiversity friendly areas

Microforests following Miyawake method

10 times faster, 20 times more biodiversity, 30 times denser and local.

Native trees and shrubs at high density

Quercus robur

Pinus sylvestris

Betula pubescens, Sorbus aucuparia

Malus sylvestris, Corylus avellana, Crataegus monogyna, Eponymous europaeus, Ilex aquifolium

Prunus avium, Prunus spinosa.

Bulbs Snowdrop, *Galanthus nivalis*, Bluebell, Summer snowflake *Leucojum aestivum*

Whip planting 90% feathered planting,10%

4/sq m.

Ground flora to include

Bluebell, burdock, hogweed, dog violet, hedge garlic mustard, lesser knapweed, meadowsweet, ramsons, red campion, wood avens and primrose.

5 Chemical free growing

Guidelines and what alternatives are there?

Use guards and then strim around each tree

Non-herbicide control (trampling, mulches, mats, etc.) is generally realistic only on small sites and in highly sensitive areas (e.g., aquatic buffer zones).

Where to get good information?

https://www.woodlandtrust.org.uk/plant-trees/advice/care/

6 **Promote wildflowers: where and how?**

Roadside verges (mow following guidelines)

Cutting guidelines and establishing a hedgerow

Hedgerows and the Law

> The Wildlife Act, 1976, as amended by the Wildlife (Amendment) Act, 2000
> This act gives some protection to wildlife in hedgerows. Under section 40 of the 1976 Wildlife Act, as amended by Section 46 of the Wildlife Amendment Act, 2000, it is forbidden to cut or remove hedgerows or destroy other vegetation during the bird nesting season, from the 1st of March to the 31st of August each year.

Exceptions occur such as when the Roads Authorities carry out hedge cutting for reasons of public safety. They must be able to provide you with valid reason for carrying out the activity during the nesting season.

Most hedgerow cutting is reactive and carried out too late in the year resulting in damage to hedgerows.

Irish hedgerows are home to two thirds of our nesting birds and many of our small mammals use them as route ways. They are particularly important for lesser horseshoe bats that use them as flight paths. They are an important and distinctive feature of our countryside and arguably one of our richest stores of biodiversity.

□

Modern agricultural methods have resulted in the removal of many of Ireland's rural hedgerow habitats. Hedgerows contain many shrub species normally found on the woodland edge, such as Dog Roses, Elder, Hawthorn, Blackberry, Wild Cherry, and Blackthorn. Dog Roses (Feirdhrís) are a wild rose. The fruit, known as hips, are rich in Vitamin C. Blackberry (Dris) is a thorny, hedgerow shrub. Blackbirds, warblers, and other birds eat the berries, and the seeds are a food source for seed-eating birds, such as finches.

Hedge cutting

Hedgerows are important heritage features. They provide food and shelter for a range of wildlife, including birds, insects and wildflowers and are an important part of our landscape.
Summary Guidelines for hedgerow trimming to benefit wildlife.
Trim hedgerows in rotation, so that some areas are always left uncut
Aim to trim a hedge every three years
Aim for a triangular 'A' shape and allow the top to grow as high as possible
Aim to trim in late winter (January/February) so that vital nuts and berries are available as food for wildlife in the autumn
Try to avoid spray drift and fertiliser from reaching the hedgerow - leave a 1.5m margin between crop or pasture and hedgerow
Leave some trees to grow to full height
*(Adapted from Irish Hedgerows: Networks for Nature by David Hickie)

Planting New Hedgerows

'New stockproof hedgerows are valuable additions to farms, wildlife and the countryside.'
When planning new hedgerows:
Identify the reason for planting
Choose native species
Stock-proof
Control weeds

Choosing Species

• Native species, adapted to Irish conditions benefit wildlife more.
• Locally grown plants, tolerant of local conditions, are likely to thrive.
• Plants grown from locally collected seed conserves local provenance (origin), but this takes time, effort, and patience.
• Thorny species such as whitethorn or blackthorn are essential for a stockproof hedgerow.
• A variety of species provides a varied food supply throughout the year for more wildlife. Include another hedgerow species or climber approximately every metre. Include a nurse species such as alder.
• Include a tree species at irregular intervals, provided it will be allowed to grow up and is NOT topped when routinely trimming the hedgerow. Avoid

trees that cast dense shade, such as sycamore, beech, and chestnut.

Hedgerow Species

These species survive routine trimming as a hedgerow while individual stems can be allowed to grow up and mature into trees.

• Whitethorn (Hawthorn): Predominant hedgerow species. Hardy, fast-growing and tolerates most soils except very wet. High elevations unsuitable.

• Blackthorn: suits most soils except very wet. Suits exposed and coastal sites. Spreads by suckers, good for gapping up, but is invasive.

• Holly: slow growing evergreen. Tolerates exposed sites and shade. Suitable under trees. Male and female plants required for berries.

• Spindle: prefers alkaline but tolerates a wide range of soils. Open, infertile site better for fruit production.

• Guelder Rose: prefers alkaline, fertile, clay soils and neutral wet soils. Acid soils unsuitable. Competitive in new hedgerows.

• Hazel: prefers heavier, fertile soils. Tolerates some shade. Understory species. Competitive in new hedgerows.

Climbers

Climbers colonise hedgerows but can be planted.

• Dog Rose: tolerates wide range of soils. Provides rose hips.

• Woodbine (Honeysuckle): prefers neutral to light acid soils. Notable scented flowers.

Trees

These trees are suitable in hedgerows, provided they are allowed to grow up and mature and are not topped when trimming the hedgerow.

• Alder: useful for very wet sites and riverbanks. Adapted to most soils. Ideal nurse species as shelters new hedgerows and fixes Nitrogen.

• Crab apple: thrives in all fertile and heavy soils.

• Birches: prefer light infertile soils. Don't like shade. Downy birch suits poorly drained peat. Silver Birch needs good

drainage and sunny site.

• Willows: useful for wet sites and stabilising riverbanks.
Tolerate flooding. Fast growing.

• Wild Cherry: prefers fertile soils. Wet soils unsuitable. Shallow rooting. Tolerates some shade. Susceptible to bacterial canker.

• Rowan: grows in poor thin acid soils. Suits exposed sites, up to 1000m. More fruit in open infertile sites.

• Oak: prefers clay soils and damp lowlands. Poorly drained infertile soils unsuitable.

• Ash: prefers well drained neutral to alkaline soil. Tolerates exposed or coastal areas. Shallow rooting system doesn't suit tillage fields. Casts shade.

Planting Hedgerows

Weather: Avoid waterlogged soil and very wet or frosty weather.

Timing: Plant from October to March. Autumn is best in free-draining ground, spring in heavy soil.

Soil preparation: Cultivation before planting is essential for optimum growth. Mounding is advisable in wet conditions.

Fertiliser: Digging in well-rotted Farmyard Manure encourages growth, but also weeds.

Plants: 2–3-year-old plants are suitable. Bushy healthy roots and thick lower stems are more important than height. Roots must be kept moist before and during planting to avoid drying out and dying.

For further information contact your localrnature.com

Planting Hedgerows

Depth: Plant to the same depth as the plants were previously planted and firm in.

Spacing: Allow up to eight plants per metre. A staggered double row is preferable with plants 250mm apart and 300mm between rows. A single row at 300mm spacing may be adequate, if well maintained.

Recommended ratios of different species suitable for stockproof and wildlife hedgerow. Hawthorns will usually make up the greater portion of the hedgerow.

Whitethorn/hawthorn 60%

Blackthorn 15%

The remaining 25% can be made up of a selection of the following depending on their suitability for local soil and climate conditions.

Gorse/Furze

Holly

Hazel

Spindle

Guelder rose

Dog rose

Honeysuckle

- A good idea of the most suitable plants is to have a look at some of the more diverse hedgerows in the local area. A diverse hedgerow will usually have a minimum of 5 different woody species of tree and shrubs in it.
- Improve native hedgerow (make stockproof, no wire, rejuvenate if very old, work outside bird nesting season)
- Develop pond or wetland (not under trees, ensure regular water supply, good shape and mixture of shallow and deep edges, plant with local natives etc.)
- Get data on schemes which monitor environmental quality, interpret, and put it on social media i.e., EPA water quality information.
- Make submissions to LA to ensure new development is good for biodiversity, landscaping benefits biodiversity in public open spaces, all playgrounds naturalistic and important sites retained and enhanced.
- Promote biodiversity in the community through a range of actions:
- Set up Facebook page, post lots of pics, promote NBDC surveys and show results, post interviews with local activists, results of mid-term review of BAP etc. Ask for seasonal photos spring, summer, autumn winter (species will be identified and prize given to monthly winner).
- Organise a garden tree and shrub give away of natives and pollinator friendly species.
- Encourage replacement of undesirables with pollinator friendly species
- Arrange for everyone to get the All-Ireland Pollinator plan. Concern with pollinators has led to the encouragement of native as well as non-native species which provide food for pollinators (ref.5 & 9).
- Provide advice on bird nesting boxes, bat boxes, barn owl boxes, swift boxes, how to sight and care for them.
- Set up garden buddy scheme to link new gardeners to experienced ones
- Run two events/year related to biodiversity which could be
- Weed control workshop

- Seed collection event
- Wildlife walk
- Foraging
- Buy a range of useful equipment and books and arrange to loan it out to community. List in Appendix 2.
- If local festival being planned ensure biodiversity covered i.e., Phizzfest always had a walk or talk about local biodiversity.

Good use for vacant shop

- Set up display about biodiversity getting posters etc from group, showing where actions are taking place, summarizing work each year etc
- https://www.heritagecouncil.ie/publications?q=juanita+browne – gardening for Biodiversity
- https://naturanaute.com/2019/07/18/when-is-a-wildflower-not-a-wildflower/?fbclid=IwAR0fZJF0KacyUReipVboAc-dJyq4Kdp2qDj31JTn7R-9rsd_q0NRd9Zqwxo - sources for material – relevance of using locally sourced seeds for native planting.

Primary Schools and Local Biodiversity

Background

Curriculum of primary school is nature friendly. 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.

A community-based initiative will involve the TT 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, hopefully 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.

So good chance of valuable local greening training if that teacher is interested in wildlife and gardening, if it is a green school which is already doing extra curricular stuff and there is a sympathetic principal (sympathetic to the area, community, ideally from the area). If those conditions exist and school grounds have potential for biodiversity friendly works (landscaping or erection of bird boxes etc.) or/and school is adjacent to a site of biodiversity interest, then

there is lots that can be done. The following actions are suggested. Have a meeting and discuss which are practical for your group. Add to the list too.

Step One

- 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 very good.
- Encourage the teacher (and school) to join an environmental NGO such as Biodiversity in Schools, BirdWatch or the Irish Peatland Conservation Council which produces regular magazines or newsletters with sections for young children.
- Research the following before making a formal approach to the school.
- Find out the type of expertise you have in your locality. You might have someone who knows a few birds or plants or is a keen gardener. You might have an artist in the locality who could go into a school, show children how to draw nature or bring in some of their work which is related to nature.
- Research the kinds of freebees offered to schools from trees to posters and present this information to the school including materials produced by
- Burren Beo Trust zooms produced by Heritage in Schools and John Feehan for Offaly Heritage Facebook page.
- Draw up another list of resources needed. Encourage school 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 suitable for young children. Examine potential for sponsorship to obtain these books and equipment.
- Discover the name of local Heritage in School expert on biodiversity. Pass this on to school. These visits are subsidized by the Heritage Council.

Step Two

Topics for discussion

- Ask school to arrange outings to places which provide interpretation about biodiversity (such as the IPCC run Lullymore peatland centre, Wicklow Mts National Park etc.). Most kids love to be outside and on trips.
- 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.
- What the community can do?
- Support the school to learn about biodiversity in a public space accessible to school. Provide some information so that school can bring children out (possibly with parents for insurance purposes), learn species, take pics and samples, do project in class. 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 wants to promote itself an exhibition could be prepared about that space and launched with much publicity.

- If school 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).
- A school 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. Make that tree a focus of study for whole school that year (language, folklore, science, songs usage etc.).
- A trail could also 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).

Equipment etc.

Workshops

Workshop with The Herpetological Society of Ireland

Workshop with Bat Groups

Workshop with NPWS

Equipment

Books etc. (x indicates number required)

Heritage Council Grass Identification Guide (x1) National Biodiversity Centre

Tree and Shrubs Swatch (X5) from National Biodiversity Centre

Bumblebee Swatch (x5) from National Biodiversity Centre

Butterfly Swatch (x5) from National Biodiversity Centre

Ladybird Swatch (x5) from National Biodiversity Centre

The Birds of Ireland – A Field Guide (x2) Source??

Britain's Dragonflies Source?

Guide to Freshwater Invertebrates (x5)

Guide to Commoner Water Plants (x5)

A Naturalist Guide to the Trees of Britain and Northern Europe

The Wildflower Key

Zoe Devlin Wildflowers of Ireland Publisher?

Teach yourself Irish Garden Bird Songs

Field Guide to Moths of Great Britain and Ireland

A Field Studies Council Guide to British Bats (x3)

Binoculars

Opticron Oregon 4 PC 8x32 Black Binoculars (x2)

Straight Tip Tweezers (x5)

Heavy Duty Sampling Trays (x5)

Student Hand Net (x3)

Echo Meter Touch 2 Bat Detector (x2 – Android / iOS)

Botanical Drying Paper

Botanical Press

Bug Viewer Boxes – small x2 / x4 mag (x5)

Bug Viewer Boxes – square x3 mag (x5)

Field Lenses (x5)?

Magenta Bat 5 Bat Detector (x3)

Apps

1 Bird ID

Bird Net app

BirdNet app (for androids and iphones) to aggregate on a map the birds that visit the estate. The app listens to bird calls (about a MB of data each time) and identifies the likely species of bird from the sound in real time. The BirdNet project at Cornell university have given us (anonymised) data to build the map. We have encouraged residents to download the app and identify and log bird calls on their phones. This has created awareness in our estate of the unique range of indigenous and migratory birds that visit the estate and the nearby Carysfort park.

Tree ID

Curio app

Contacts

NGO websites might have information but not targeting children

Other similar initiatives CWF

Through library or local networking look for bods

Heritage in Schools NB

Zoom courses

https://www.biodiversityireland.ie/learn-to-identify-irelands-butterflies-an-ecourse/

Money

LA (Heritage and Biodiversity Officer budgets)

or PPN's

Dublin City Council's 2021 Community Grants Scheme

at https://www.dublincity.ie/residential/improving-my-community

Leader companies

Heritage Council

Community Foundations

NPWS (but principally for designated sites)

Education Guide based at the Wexford Wildfowl Reserve (NPWS) might be a winner – subject to Covid of course – they do run outreach projects and perhaps LAWPRO might fund some on their side?

Company sponsorship

Appendix 6 Removal of invasive species

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

RHODODENDRON

Rhododendron ponticum

Invasive Plant Information Note

What is it?

Rhododendron (*Rhododendron ponticum*) is a large perennial evergreen, acid loving shrub which is native to the Iberian Peninsula and Asia. It was introduced to Ireland during the 18th Century as an ornamental garden plant because of its attractive flowers. There are over 900 species of Rhododendron, but only *Rhododendron ponticum* is invasive in Ireland. Since its introduction, Rhododendron has escaped into the wild and is particularly invasive in the west, north-west and south-west of the country. Rhododendron thrives on acidic soil in areas with mild, moist climatic conditions. It can colonise a range of habitats including agricultural land, grasslands, woodland, urban areas, roadsides and wastelands (See Fig. 2). Please see link to its distribution across Ireland: http://maps.biodiversityireland.ie/#/Home.

Fig. 1: Rhododendron (www.arthurleej.com)

Fig. 2: Rhododendron infestation (www.nigelborrington.com)

Why should we be worried about it?

Rhododendron is an aggressive coloniser which is both environmentally and ecologically damaging to infected sites. Once established, it forms dense, long-lived thickets which smother the ground flora and suppress the regeneration of native trees and shrubs (See Fig. 4). Its dense thickets can reach several metres in height (See Fig. 1). Well established thickets eventually form a toxic layer of leaf litter which produces a dark sterile environment and supports little wildlife. The foliage of Rhododendron is unpalatable to grazing animals. Dense tangles of Rhododendron stems can block pathways, smother watercourses and encroach on roadways, resulting in an impingement of sight-lines. **In some cases, infestations have been so expensive to control that land has been abandoned.**

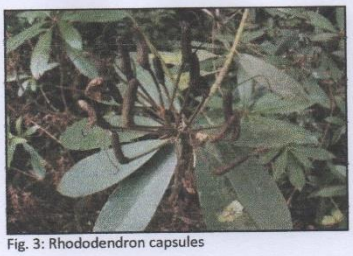

Fig. 3: Rhododendron capsules (www.nonnativespecies.org)

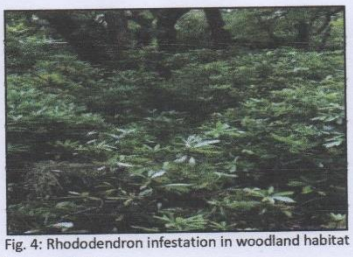

Fig. 4: Rhododendron infestation in woodland habitat (www.zoonar.de)

How do we recognise Rhododendron?

It forms a compact shrub in open areas, whereas in the shade it adopts a larger lateral spread. The leaves of Rhododendron are waxy and oval-shaped (See Fig. 5). The upper side is dark green in colour while the lower side is paler and hairless. Leaves are 10-20cm long and range in width from 2-6cm. The leaf stem can be 1-3cm long. Rhododendron does not usually produce flowers until it is 10-12 years old. Flowering then occurs from May to July. Flowers can vary in colour from lilac pink to various light and dark shades of purple; spotted with brown and orange (See Fig 6). The flowers are bell-shaped and are held in large clusters. The fruit is a woody capsule containing several seeds that can persist on the plant for up to 3 years (See Fig. 3).

Fig. 5: Waxy Rhododendron leaves (www.aphotoflora.com)

Fig. 6: Rhododendron flower head (www.nonnativespecies.org)

Fig. 7: Tiny Rhododendron seeds (www.burncoose.co.uk)

How does Rhododendron spread?

It can reproduce by both sexual (seed) and asexual (vegetative) means. Each flower head can produce between 3,000 and 7,000 seeds (See Fig. 7). This means that a single Rhododendron bush can produce over 1 million seeds per annum. Rhododendron seeds are amongst the smallest and lightest of any plant species and are designed primarily for dispersal by wind. Rhododendron seeds can be dispersed up to 100 metres by wind. Rhododendron is also capable of reproducing by vegetative means, both by suckering from roots and by layering wherever branches touch the ground. In Ireland, colonisation takes place mainly through seed dispersal.

How to manage Rhododendron

Rhododendron is an invasive species which may take several years to eradicate from a site. Non-chemical treatment, chemical treatment or a combination of both can be employed to control an infestation. Younger plants in newly-established infected sites can be readily hand-pulled. Mature plants can be mechanically uprooted as the root system of Rhododendron is generally located in the top 45cm of the soil. **Please note that Rhododendron re-grows vigorously when cut.** Seeds are tiny and may be spread unintentionally on shoes, clothes and machinery. Please note that regular and systematic follow-up is required to deal with re-growth and seedling germination, irrespective of the control method employed. In order for eradication projects to be successful, tackle oldest bushes first to prevent the dispersal of seeds.

For Further Information on Invasive Alien Species please visit:

- Invasive Species Ireland http://invasivespeciesireland.com/
- European Commission http://ec.europa.eu/environment/nature/invasivealien/index_en.htm

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

JAPANESE KNOTWEED

Fallopia japonica

Invasive Plant Information Note

What is it?

Japanese knotweed (*Fallopia japonica)* is an invasive herbaceous perennial plant which is native to Japan and northern China. It was introduced to Ireland as an ornamental plant in the 19th Century. Since then, it has established wild populations in a variety of habitat types across the country, including river banks, roadsides and waste ground. Please see link to its widespread distribution: http://maps.biodiversityireland.ie/#/Home.

Fig. 1: Japanese knotweed flowers (© EPPO)

Fig. 2: Aggressive growth (www.odonovanagri.com)

Why should we be worried about it?

Japanese knotweed poses a number of threats to farms across Ireland. It grows rapidly and growth rates of up to 40mm a day have been recorded. One tiny particle blowing in the wind or transported on a car tyre is enough to create an infestation. Japanese knotweed consumes fertiliser and water intended for crops. The species can seriously damage houses, buildings and hard surfaces because it has the ability to grow through concrete and tarmac (See Fig. 2). It cost an estimated £88m to remove Japanese knotweed from the London Olympic Village site in 2012. Japanese knotweed disrupts agricultural processes because livestock often avoid eating invasive plant species. Instead, they selectively feed on native plants, which in turn reduces the competition for the Japanese knotweed and allows it to colonise the site quickly. Litter can accumulate in the dense thickets formed by the plant and this build-up of waste material also encourages vermin. Japanese knotweed grows vigorously and out-competes native plants. Its tall thickets exclude all other vegetation and shade the area below. Native plants can rarely compete with this invasive species and local biodiversity is reduced.

How do we recognise Japanese knotweed?

Fig. 3: Early growth (www.online-valuations.com)

It produces fleshy red-tinged, asparagus-like shoots when it first breaks through the ground in early spring (See Fig. 3).

As the canes grow, the leaves unfurl. The leaves are oval with a pointed-tip, and have a distinctive zig-zag pattern along the stem (See Fig. 4). Leaves are 10 to 18cm long.

The stem structures are also distinctive with a green hollow/bamboo-like appearance and are dotted with dark blue-purple speckles. It forms small clusters of off white/yellow cream coloured flowers in late summer, typically forming from late July onwards (See Fig. 1).

The roots are tough, thick and wood-like in their appearance. If snapped, they show a bright orange colour inside and have a consistency similar to that of a carrot (See Fig. 6). The root structures usually extend up to 5 metres in a lateral direction and 2 metres deep from the over ground plant.

During the winter season the stems die back and become an orange-brown colour (See Fig. 5). These canes remain upright throughout the winter and can still be seen amongst new stands the following spring or summer.

Fig. 4: Zig-zag pattern on foliage (www.invasiveplantcompany.com)

Fig. 5: Winter canes (www.online - valuations.com)

How does Japanese knotweed spread?

Japanese knotweed has an extraordinary ability to spread vegetatively from crown, stem and rhizome if disturbed. Small sections of rhizome (See Fig. 6), as little as 0.7g, can re-grow into a new plant.

Fig. 6: Bright orange, carrot-like colour (www.japaneseknotweedsurvey.co.uk)

How to manage Japanese knotweed

Japanese knotweed is highly invasive and extremely difficult to eradicate completely. When it becomes established it may take a number of years to eliminate from a site. A combination of physical and chemical treatment is usually the most effective option. Do not uproot Japanese knotweed yourself as this exposes the underground rhizomes. Do not attempt to cut, strim or mow Japanese knotweed. This results in more vigorous growth from the cut infestation. The viable debris can then be spread by wind to unaffected sites. Please note that a fragment the size of a finger nail can spread this species. Rhizome fragments can easily be transported unintentionally on clothes and shoes. It is illegal to allow Japanese knotweed spread to the wild. **It is recommended that any attempt to control Japanese knotweed should only be carried out by trained and qualified persons.**

For Further Information please visit:

- Invasive Species Ireland http://invasivespeciesireland.com/
- European Commission http://ec.europa.eu/environment/nature/invasivealien/index_en.htm

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

HIMALAYAN BALSAM

Impatiens glandulifera

Invasive Plant Information Note

What is it?

Himalayan balsam (*Impatiens glandulifera*) is an invasive annual plant species which is native to the foothills of the Pakistani and Indian Himalayas. It was first introduced to Europe in the mid-1800s as an ornamental garden plant. Since then, it has escaped into the wild and is now present in most parts of Ireland. Himalayan balsam is particularly frequent in damp soil areas such as along the banks of watercourses and damp woodland. Please see link to its distribution across Ireland: http://maps.biodiversityireland.ie/#/Home.

Fig. 1: Himalayan balsam © CABI

Fig. 2: Invading pasture land © CABI

Why should we be worried about it?

Himalayan balsam grows rapidly and spreads quickly. From seed it can grow up to 2.5 metres high in a single season. It absorbs fertiliser and water intended for crops. Himalayan balsam seeds germinate from March and develop rapidly over the growing season into dense upright stands. These stands smother native plants and prevent them from establishing (See Fig. 2). The combination of its high rate of reproduction and large size facilitates rapid colonisation. When the plant dies back in autumn it can leave the ground bare and vulnerable to erosion. Himalayan balsam can increase costs on farms due to loss of land and habitat, riverbank erosion, increased flood risk and loss of amenity.

Fig. 3: Explosive seed dispersal
(www.fineartamerica.com)

Fig. 4: Himalayan balsam flower
(www.paulrobson.co.uk)

How do we recognise Himalayan balsam?

The seedlings of Himalayan balsam begin to emerge as early as March. The stems are pinkish-red, brittle and hollow with side branches originating from joints in the stem (See Fig. 5). Its stems are translucent and succulent. The leaves of the Himalayan balsam are dark green, lance-shaped and have sharply serrated edges. Leaves are 5-18cm long and range in width from 3-7cm (See Fig. 6). Himalayan balsam flowers can vary between white, pink and purple, with colouration differing among individuals within the same habitat. Each flower has 5 petals and is said to look like an English policeman's helmet (See Fig. 1 & Fig. 4). The fruit capsules are green and contain many spherical seeds (which may be green or brown), eventually becoming black when they are mature. Flowering commences by June and extends into October. Over the winter, the mature Himalayan balsam plants rot and decay.

Fig. 5: Himalayan balsam stem (www.gobotany.newenglandwild.org)

Fig. 6: Himalayan balsam foliage (www.bcinvasives.ca)

Fig. 7: Shallow root system (www.shim.bc.ca)

How does Himalayan balsam spread?

Himalayan balsam produces up to 2,500 seeds per plant. **These seeds are released explosively from capsules when disturbed (See Fig. 3).** The seeds can be propelled up to 7 metres from the mother plant. The seeds can remain viable for up to 18 months and are readily dispersed by wind or in water.

How to manage Himalayan balsam

Complete eradication of Himalayan balsam from a site may take a number of years. Non-chemical, chemical or a combination of both can be employed to remove the species. Grazing is an effective non-chemical control for Himalayan balsam. Grazing and trampling by livestock can be introduced from early May when plants are tender and sweet. Hand-pulling alone can also be employed if grazing is not an option. Himalayan balsam has a shallow root system so is easy to uproot (See Fig. 7). Care should be taken to remove the whole plant. This form of control should ideally happen in June, when the plants have grown to a good height, but have not yet flowered. Hand pulling may require a follow-up in August due to new seeds sprouting. Vegetative material can be disposed of by composting unless seeds are present, in which case the material should be disposed of by 'deep burial.'

For Further Information please visit:

- Invasive Species Ireland http://invasivespeciesireland.com/
- European Commission http://ec.europa.eu/environment/nature/invasivealien/index_en.htm

Appendix 7 Hedgerow survey data, criteria for hedgerow survey can be found below the table

Site	Date	Adjacent land use	Historic value	Species diversityTree & climbers	Species Diversity fruit	Species Diversityfern	Structure and condition	Habitat connectivity	Landscape significance	Condition assessment		Continuityfeatures	Negative points	Total score
Kelly's Farm, Killeenagh Hedgerow 1	8/10/20	Fodder (hay)	2	2	1	1	0	3	2	Height	2	2	Himalayan Balsam (alien invasive) is present. Flail cut, butnot recently	19
										Width	2			

											Profile	1			
											Base density	2			
Hedgerow 2	8/10/20	Fodder (hay)	2	2	0	0	0	3	2	Height	2	2	Himalayan Balsam (alien invasive) is present. Flail cut, butnot recently	18
										Width	2			
										Profile	1			
										Base density	2			

Site	Date	Adjacent land use	Historic value	Species diversityTree & climbers	Species Diversity hit	Species Diversityfern	Structure and condition	Habitat connectivity	Landscape significance	Condition assessment		Continuityfeatures	Negative points	Total score
Smith's Farm, Coolbeggan East Hedgerow 1	8/10/20	Cattle (dairy)	3	3	3	4	3	1	2	Height	2	2	Japanese knotweed (an alien invasive) is growing across the road, on an adjacent property. Flail cut	26

														annually	
											Width	2			
											Profile	1			
											Base density	2			
Hedgerow 2	8/10/20	Cattle (dairy)	2	2	1	0	2	2	2		Height	1	2	Himalayan Balsam (alien invasive) is present. Flail cut, butnot recently	17
											Width	1			
											Profile	1			
											Base density	1			

Criteria for assessing Hedgerow Significance (historical, ecological and landscape)

	0	1	2	3	4
Historical Significance	Low Significance	Slightly Significant	Moderately Significant	Significant	Highly Significant
Period of Establishment (B, B1, B2, B3, B4, F, W)	Recently Established (0-25 years)	Internal Field Boundary	Roadside / Rail / Canal Boundary: Farm Boundary, March ditch*, Mearing* *old terms for farm boundaries	Boundary appears on 1st Edition O.S.	Townland Parish / County Boundary: Area shown as, or connected to, woodland on 1st Edition O.S. map: Connects to feature recorded on Sites and Monuments Record
				Non-linear (excluding roadside)	
		Past evidence of laying or coppicing			
	0	1	2	3	4
Species Diversity Significance	Low Significance	Slightly Significant	Moderately Significant	Significant	Highly Significant
Tree / Shrub / Climber	(1-3 species / 30m strip)	(4/5 species / 30m strip)	(6/7 species / 30m strip)	(8/9 species / 30m strip)	(10+ species / 30m

Species Count (Floristic)(All species)					strip)

	0	1	2	3	4
Ground Flora Significance	Low Significance	Slightly Significant	Moderately Significant	Significant	Highly Significant
Species type (Y)	Dominated by ruderal species* - nettles / docks / thistles / cleavers				
Species Count (fromlist) (Floristic)	(<2 species / 30m strip)	(2-3 species / 30m strip)	(4-5 species / 30m strip)	(6-7 species / 30m strip)	(>7 species / 30m strip)
Pteridophytes (Ferns)(from list) (Floristic)				3-5 species	>5 species

*Ruderal species - Weedy vegetation that shows a preference for growing on compacted, ploughed, or otherwise disturbed ground.

	0	1	2	3	4
Structure, Construction & Associated Features	Low Significance	Slightly Significant	Moderately Significant	Significant	Highly Significant
Wall / Bank (G1, G2, G3, H)	None	Wall / Bank < 0.5m (height / depth)	Wall / Bank 0.5 - 1m	Wall / Bank > 1m	Double Ditch
Drain / Ditch (B, I, I1)			Dry Ditch	Wet Ditch / Drain	Stream / River

Other (Target Notes)			Badger Set		
Other (G3)			Green Lane		

	0	1	2	3	4
Habitat Connectivity Significance	Low Significance	Slightly Significant	Moderately Significant	Significant	Highly Significant
(C1, C2, D1, D2, D3)	No connection with other semi-naturalhabitat	Single link with semi-natural habitat including hedgerow	Multiple links with semi-natural habitats, including other hedgerows	Link with woodland / forest habitat	Link with designated area, particularly woodland
	0	1	2	3	4
Landscape Significance	Low Significance	Slightly Significant	Moderately Significant	Significant	Highly Significant
(J, P, Q, Desk study)		Wind shaped	Mature Hedgerow Trees		Area covered by Landscape designation (Landscape Conservation Order, TPO, Amenity Area Order)

Other Factor/s of Significance Record any other factors of significance which are not included above,

e.g., upland hedgerow with landscape significance.

: Criteria for assessing condition assessment of hedgerows.

Structural Variables	0	1	2	3

Dimensions	Unfavourable	Adequate	Favourable	Highly favourable
Height (K)	<1.5m	1.5 – 2.5m	2.5 – 4m	>4m
Width (L)	<1m	1 – 2m	2- 3m	>3m
Profile (J, J1)	Remnant; Derelict;	Wind shaped, Losing Base Structure	Boxed / A-shaped; Straight sided	Overgrown; Top heavy/ undercut; Outgrowths at base
Basal density / porosity tolight of woody shrubs? (N)	Open	Semi-translucent	Semi-opaque	Opaque / Dense

Continuity	0	1	2	3
	Unfavourable	Adequate	Favourable	Highly favourable
% gaps (M)	>10%	5-10%	<5%	Continuous
Specific gaps (M1)	Individual Gap > 5m	Individual gap <5m	No gaps	No gaps

Negative Indicators/ Degradation / Issuesaffecting long-term viability	0	1	2	3
	Unfavourable	Adequate	Favourable	Highly favourable
Bank / Wall (O, O1)	>20% of the length of the hedge degraded	<20% of the length of the hedge degraded	Minor degradation	No degradation
% of canopy dominated by	>25%			

Ivy (Floristic)				
Unfavourable species composition (from list) (Floristic)	>10% of woody growthvolume comprised of unfavourable species			
Ground Flora / Hedge Base (Y)	> 20% of ground layer showing evidence of Herbicide Use			
Ground Flora / Hedge Base (Y)	Contain Noxious weeds •/ > 20% Dominated by Nutrient Rich Species			
Ground Flora / Hedge Base (Y)	Presence of alien invasive species ß			
Degraded Margin (R2, R4)	Ploughing up to base of hedge shrubs or Poaching/erosion		(grassy) margin (2 m or greater on one side of the hedge)	(grassy) margins (2 m or greater on both sides of thehedge)

Noxious Weeds - Native plants of disturbed ground that impact adversely on agriculture. They may compete for space with tillage or forage crops, harbourpests or diseases, or be injurious to livestock or human beings. These are: Common ragwort (Senecio jacobea), Spear thistle (Cirsium vulgare), Creeping or field thistle (C. arvense) and two species of dock, i.e., the curled dock (Rumex crispus) and the broad-leaved dock (Rumex obtusifolius).

ßAlien invasive species – see Table 1: 'Problematic Plant Species: Top 39' at http://invasives.biodiversityireland.ie/ Those listed as occurring in woodland, hedgerows, demesnes and on roadsides often occur in hedgerows. Cherry laurel (Prunus laurocerasus) can be added to this list.

Warning status hedgerow condition criteria

	Indicate Warning Status
Obvious signs of poor condition (S)	Includes weak growth, basal decay, effects of spray drift
Risk of infection; Management SafetyIssues (U, X3) Impact on biodiversity (U1)	Wire fixed to stems; managed using excavator type machinery Managed out of season
Hedgerow Tree Sustainability (Q)	Only Mature Trees present