



The Mangala
Ballybrack Woods Biodiversity Action Plan
2020-2024



*Wild*work

HELPING PEOPLE HELP NATURE HELP PEOPLE

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The Mangala
 Ballybrack Woods Biodiversity Action Plan 2020-2024
 Produced for Douglas Tidy Towns by
 William O’Halloran and Finbarr Wallace
 of Wild Work
 December 2019

This project received financial support from

Cork County Council.



Acknowledgements

Sincere thanks to all in the Douglas community who took the time to consider how they would like to help nature in Douglas. Whether this was by attending awareness sessions, submitting ideas, or providing feedback on drafts, your input was of immense value in completing this plan. Particular thanks also to all our Tidy Towns members (old and current) for their ongoing support for all our activities. Douglas Tidy Towns has been developing this project with Wild Work for a number of years and we are very grateful for both their expertise and enthusiasm. From the beginning, the project has received support from Cork County Council. Since the 2019 city/county local authority boundary change, Cork City Council has also supported the project.

Douglas Tidy Towns

February 2020

Introduction

Ballybrack Woods, known locally as 'The Mangala', is situated in a riverine wooded valley in Douglas in the south east environs of Cork City. Prior to 2019 Douglas was administratively split between the County and City of Cork. As of the end of May 2019 the entire area of Douglas covered by Douglas Tidy Towns is located within the administrative area of Cork City Council.

The wood is an important recreational amenity for local people and a place with an interesting array of habitats, flora and fauna. The valley is predominantly made up of semi-natural, and highly modified, woodlands, scrub, wet grassland and freshwater streams. An array of non-native plant species can also be found.

Douglas Tidy Towns, a local volunteer group, began working on developing a Biodiversity Action Plan for the woods in 2016. Their hope is that the plan will engage the local community in caring for nature and biodiversity in Douglas and that the plan itself will be utilised to guide how the wood is managed and maintained in the future.

This document outlines biodiversity actions and associated information related to the development of these actions.

Ballybrack Woods provides an interesting example of the influence humans can have on natural environments. Evidence of old landscape features such as quarries and field boundaries can still be found. There are grasslands and woodlands that have been heavily disturbed from recent construction works and there are other parts that are being managed for wildlife. Not far downstream of the wood, the Ballybrack Stream (also known as Douglas River), becomes completely covered by built up environment (until re-emerging once more into the Douglas Estuary having merged with the Tramore River); on the contrary, the further one travels up the valley the quality and condition of habitats improves, resembling what our landscape could be like if we managed it for the benefit of nature.

About Douglas Tidy Towns

Since 2000 Douglas Tidy Towns, with support from Douglas Community Association, has been working to enhance Douglas village and surrounding areas. The activities of Douglas Tidy Towns include keeping the area it covers clean and litter free, enhancing the visual attractiveness of public areas and promoting recycling. Over the past number of years Douglas Tidy Towns has worked to enhance biodiversity in its functional area. This has included:

- Developing a pollinator corridor
- Working to reduce the use of pesticides in public spaces
- Organising the delivery of biodiversity related educational events in public spaces and in schools
- Liaising with local authorities and others to tackle Japanese Knotweed in Ballybrack Woods
- Planting trees
- Liaising with local authorities and others to manage grassland to benefit biodiversity
- Planting wildflower strips
- Working with local Men's Sheds, Scout Groups and environmental NGOs erecting BAT Boxes in Ballybrack Woods.

In 2016 Douglas Tidy Town commissioned a habitat map of Ballybrack Woods, one of a number of areas of biodiversity interest in its area.

About Wild Work

Wild Work is an initiative of SECAD Partnership CLG, developed in response to a need identified by SECAD from years of experience supporting environmental projects in local communities. Wild Work supports everyone committed to helping nature. Our primary focus is to connect business, biodiversity and local communities. We also support the work of local and national organisations involved in the conservation and protection of our natural environment. With our practical expertise, we help people create and care for meadows, woodlands, beaches, rivers and other natural habitats, in urban and rural settings. We strive to work in line with best practice; working with nature and not against; and we value research as a key component of our work. Our aim is to understand the bigger picture, so we can help people do the right thing. We work with:

- Businesses big and small
- Local community groups and individuals
- Schools and colleges
- Local authorities and other state bodies
- Farmers
- Conservation organisations and charities.

Wild Work's Social Ethos

To benefit society and nature;

We want to foster people's good will to ensure our local flora, fauna and habitats are protected, valued and enhanced. We also want people who connect with the Wild Work movement to benefit positively in terms of improved health and well-being.

To educate and raise awareness;

We follow a place-based approach, working with nature and the environment in a positive way to have a real and practical impact on environmental issues; because increasing people's awareness, respect and understanding, helps them care more effectively for our natural world.

To support employment activation;

We provide quality work experience opportunities for people and aim to contribute to the creation of fulfilling jobs, particularly in the biodiversity sector. Visit www.wildwork.ie for further information.

About Biodiversity and Biodiversity Plans

The term biodiversity began to be used widely in the 1980s. It is a shorthand way of saying biological diversity. A simple way to describe 'biological diversity' is to say it means all the different types and individuals of living things on the planet, the places they live and the ways they live with each other.

An even simpler way to describe biodiversity might be 'Nature'!

What do Biodiversity Action Plans generally do?

In general Biodiversity Action Plans look at what species and habitats are in an area and what issues there might be for species and habitats in that area.

A good plan will then identify what actions are needed to address any issues, who is going to carry out the actions and in what timeframe as well as what resources are needed to carry out the plan, and who can help.

A local Biodiversity Action Plan such as this one might choose to look at what can be done to enhance the local area to benefit biodiversity, but actions will still need to be identified as well as the who, when and how.

Not everything a group might like to do may be achievable at once, so it is a good idea to prioritise actions based on resources available.

A good local Biodiversity Action Plan also makes sure that we don't harm Nature when we want to help Nature.

Making a Biodiversity Action Plan means encourages us to think about Nature in our area, how we would like to help Nature in our area and helps us keep track of the actions we take to help Nature.

Ideally making a local Biodiversity Action Plan means we learn more about Nature in our area, value Nature in our area more and conserve and enhance Nature in our area more.

Biodiversity Action Plans such as this should be reviewed every 5 years, as that provides an opportunity to look at what has been achieved and to look at issues still to be worked on, and how future actions might be resourced.

Why do we need Biodiversity Action Plans?

1950s - It is increasingly noticed that the way people live on the planet is damaging other species and the places those species need to live. It is realised that this damage is also a problem for people.

1980s - Under the United Nations Environment Program, people across the planet decide to act to protect all species, the places they live and the ways they live together.

1992 - Ireland is one of 168 parties that sign up to the Convention on Biological Diversity which is designed to make sure that

- Biodiversity is protected,
- Biodiversity is kept safe for future generations,
- The benefits of Biodiversity are shared equally.

The idea of preparing Biodiversity Action Plans comes from the Convention on Biological Diversity. Ireland ratified the convention in 1996.

2002 - Ireland makes its first National Biodiversity Action Plan. This plan says that Local Authorities, like Cork County Council and Cork City Council need to prepare Biodiversity Action Plans too.

2009 - Both Cork City Council and Cork County Council publish their first Biodiversity Action Plans.

The Cork County Biodiversity Action Plan says that to make sure the plan works, lots of organisations and people need to get involved (Cork County Council, 2009).

Lots of groups of people doing a little (or a lot!!) at a local level can make a huge positive impact for Nature at county, country and global level.

Biodiversity information of interest about Douglas and Ballybrack Woods

Details of protected sites

Douglas is located very close to Cork Harbour, and much of Cork Harbour is recognised as being internationally important for habitats and species, particularly bird species.

Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are part of a European-wide network of sites called Natura 2000 that are given legal protection for their habitats and species under European Directives commonly known as the Habitats Directive (European Commission, 2017 a) and the Birds Directive (European Commission, 2017 b). Part of the boundary of Cork Harbour SPA runs north of the N25 ending just north-west of the Douglas Court shopping centre.

The mudflats and saltmarshes in this SPA provide homes for a large number and diversity of invertebrates, mainly marine worms, clams, shrimp and snails (NPWS, 2013). These provide great food for resident and migrating bird species. Grasslands and woodlands around the area provide roosting or feeding places for birds as well as habitat for other animal and plant species.

Species of conservation importance

Birds

Data from the National Biodiversity Data Centre (NBDC) shows in the region of 100 bird species recorded in the immediate Douglas area*. Many of these, such as Wood Pigeon (*Columba palumbus*), Blackbird (*Turdus merula*), Starling (*Sturnus vulgaris*), Crow (*Corvus cornix*) and Great Tit (*Parus major*) may be familiar to many of us. However less common and protected species such as Red-breasted Merganser (*Mergus serrator*), Great Crested Grebe (*Podiceps cristatus*), Long-eared Owl (*Asio otus*), and Hobby (*Falco subbuteo*) have also been recorded. Nearly half of the bird species from these NBDC records are legally protected to some degree under Irish and / or European legislation. A number of these species, including the Curlew (*Numenius arquata*), are of high conservation concern (NBDC, 2019). Many of the less common species listed in these reports are associated with the estuary and are not likely to occur in Ballybrack Woods. Wild Work staff carrying out habitat management work in Ballybrack Woods have recorded Common Buzzards (*Buteo buteo*) over the woodlands in recent years.

Mammals

Native terrestrial mammals such as Fox (*Vulpes vulpes*), Badger (*Meles meles*), Hare (*Lepus timidus hibernicus*), Irish Stoat (*Mustela erminea* subsp. *hibernica*), Hedgehog (*Erinaceus europaeus*), Red Squirrel (*Sciurus vulgaris*), Wood Mouse (*Apodemus sylvaticus*) and Otter (*Lutra lutra*) have all been recorded in or adjacent to Douglas (NBDC, 2019). Most of these species are afforded some level of protection under Wildlife and / or Animal Cruelty protection laws (NPWS, 2019 b), (Wildlife Crime, 2019). Non-native terrestrial mammal species such as European Rabbit (*Oryctolagus cuniculus*) American Mink (*Mustela vison*) and Greater White-toothed Shrew (*Crocidura russula*) have also been recorded (NBDC, 2019).

Marine mammal species Common Dolphin (*Delphinus delphis*) and Grey Seal (*Halichoerus grypus*) have been recorded in Cork Harbour near Douglas.

There is only one record for bat species currently showing in NBDC records*- Leisler's Bat (*Nyctalus leisleri*) which was recorded in 1999. This is perhaps surprising given that there is moderately suitable habitat in and around Douglas for 8 of the 9 Irish native bat species, and very suitable habitat for at least 5 of these. (NBDC, 2019).

A recent bat survey as part of an ecological survey for an Environmental Impact Assessment Report (EIAR) connected with a housing development adjacent to Ballybrack Woods recorded Common Pipistrelle

*This is for records from Irish Grid 2x2km squares W66Z and Y, and W76D, E and J. Ballybrack Woods is located along the junction of W66Z W76D & W76E.

(*Pipistrellus sensu stricto*), Soprano Pipistrelle (*Pipistrellus pygmaeus*), Leisler's Bat (*Nyctalus leisleri*) and Natterer's Bat (*Myotis nattereri*). All bat species in Ireland are strictly protected (NPWS, 2019 b).

As part of the development of a cycle track through the woods, and in consideration of the presence of bats, new lighting along the cycle track through the woods was proposed to be managed to minimise impacts on bats. In 2016 Douglas Tidy Towns were involved in the installation of bat boxes in Ballybrack Woods.

Flora

Species of flora (not including bryophytes or algae) recorded in Ballybrack Woods during a habitat mapping exercise associated with this Biodiversity Action Plan are listed in Appendix III. This list totals 154 species. Most of Ballybrack Woods is located in two 2km national grid squares- W66Z and W76E. Lists of recorded flora for those two squares from the National Biodiversity Data Centre (NBDC) website total 224 species – note that these grid squares also cover areas outside of Ballybrack Woods, so these lists most likely also include species recorded outside of the woods. Of note in the lists from the NBDC website is Little Robin (*Geranium purpureum*) which is classed as an endangered species on that website. It was not recorded in the woods, but in a housing estate nearby.

Insects

Bee species such as the Large Red-Tailed Bumble Bee (*Bombus lapidarius*) and the Buffish Mining Bee (*Andrena nigroaenea*) have been recorded. Both of these are listed as 'Near Threatened' in NBDC data.

Fish

Wild Work staff carrying out grassland habitat management work and Japanese Knotweed control in Ballybrack Woods between 2016 and 2018 reported Brown Trout (*Salmo trutta*) in the watercourse through the wood. A 2019 EIAR written in connection with a proposed housing development adjacent to the woods also indicates the presence of Brown Trout in this network of streams. (Cairn PLC, 2019).

Invasive Species

Invasive plant species have been recorded in Ballybrack Woods by Wild Work staff. There are NBDC records in and around the wood for the invasive insect species the Harlequin Ladybird (*Harmonia axyridis*) (NBDC, 2019). A number of other invasive species have been recorded in areas within 2kms of the woods. A precis of invasive species recorded in and around the park is included below. A fuller list appears Appendices IV.

Flora

- Winter Heliotrope (*Petasites fragrans*)
- Japanese Knotweed (*Fallopia japonica*) *
- Traveller's Joy (*Clematis vitalba*)
- Cherry Laurel (*Prunus laurocerasus*)
- Rhododendron (*Rhododendron ponticum*) *
- Three-cornered Leek (*Allium triquetrum*) *
- Garden Yellow-Archangel (*Lamium galeobdolon* subsp. *argentatum*)

* The spread and importation of this species is controlled by European Communities (Birds and Natural Habitats) Regulations 2011 (Irish Statute Book, 2011).

Mammals

American Mink (*Mustela vison*) have been recorded within 2kms of the woods as part of a nationwide Badger (*Meles meles*) survey, but this was in the late 1980s. However, there are many recent records for this species in Cork City and County post 2010. The spread and importation of this species is controlled by European Communities (Birds and Natural Habitats) Regulations 2011.

Insects

As mentioned above the Harlequin Ladybird (*Harmonia axyridis*) has been recorded in and around the wood. Records on the NBDC website for this species began to appear in and around Cork City around 2010 (NBDC, 2019). These were among the earliest records in the Republic of Ireland (earlier records were made in Northern Ireland (NBDC, 2019)). This invasive species of Asian origin has proved problematic elsewhere in Europe and in North America (IWT, 2019). The spread and importation of this species is controlled by European Communities (Birds and Natural Habitats) Regulations 2011 (Irish Statute Book, 2011).

Other Groups

Two species of New Zealand Flatworm *Arthurdendyus triangulates* and *Australoplana sanguinea* have been recorded in the wider Douglas area in the past two years. These species predate on native earthworm species, reducing soil health. (NBDC, 2013).

Any management, maintenance or development activities should take account of these species and every effort should be made to prevent their spread. Further research should be undertaken to establish the extent of the issue and this research should also inform a management plan. Any control measures of these species should be based on best-practice techniques. For details on management of Japanese Knotweed in the wood, Wild Work can be contacted directly. Dumping of garden waste in the woodlands in Ballybrack Woods appears problematic in terms of the introduction of non-native species.

Habitats

As part of a Habitat Mapping exercise for Douglas Tidy Towns in 2017 the following habitats in and adjacent to Ballybrack Woods were recorded. Habitats are classified according to 'A Guide to Habitats in Ireland' (Fossitt, 2000).

| Habitat Category | Habitat Type | Fossitt Code |
|-------------------------------------|-----------------------------------|--------------|
| Watercourses | Eroding/upland rivers | FW1 |
| Improved grassland | Amenity grassland | GA2 |
| Semi-natural grassland | Dry meadows and grassy verges* | GS2 |
| | Wet grassland | GS4 |
| Dense Bracken | Dense Bracken | HD1 |
| Semi-natural woodland | Oak-ash-hazel woodland* | WN2 |
| | Wet pedunculate oak-ash woodland | WN4 |
| | Wet willow-ash-alder woodland | WN6 |
| Highly modified/non-native woodland | (Mixed) broadleaved woodland | WD1 |
| Scrub/transitional woodland | Scrub | WS1 |
| | Immature woodland | WS2 |
| | Ornamental/non-native shrub | WS3 |
| | Recently-felled woodland | WS5 |
| Linear woodland/scrub | Treelines | WL2 |
| Exposed rock and disturbed Ground | Exposed siliceous rock | ER1 |
| | Spoil and bare ground | ED2 |
| | Recolonising bare ground | ED3 |
| Built Land | Stone walls and other stonework | BL1 |
| | Earth banks | BL2 |
| | Buildings and artificial surfaces | BL3 |

Table 1 Habitats recorded for Douglas Tidy Towns in 2017.

* See notes on these habitats below.

Watercourses

The parts of the river system located in the Ballybrack Woods are the last remaining accessible parts of the valley where people can experience the system in its more natural state. Downstream of the Ballybrack Woods towards the Douglas Community Centre and Douglas Village Shopping Centre, the river system has been negatively altered from its natural state, mainly because of factors associated with urbanisation. Planned flood relief measures are going to further alter the characterisation of the river from its natural state (ARUP, 2017). Further upstream of the wood, the physical characteristics of the river are in a more pristine condition.

It would be worthwhile to monitor the health of the freshwater streams through means such as aquatic invertebrate surveys. There is an opportunity within the Ballybrack Woods, to continue to allow the river to revert to its natural state. This would be of great benefit to biodiversity and is something to be considered. See also section on hydrology below.

Semi-natural grassland

Wet grassland

Mainly due to drainage and changes in agricultural grassland management, semi-natural grassland in Ireland has become an extremely vulnerable habitat type (Martin, et al., 2008). This is particularly the case with wet grasslands. Riparian habitats, like wet grassland, are important in supporting many species of flora and fauna. In a local context, the wet grassland habitats found in the Ballybrack Woods are of high importance and they should be managed as Wet grassland GS4 as opposed to Amenity grassland (improved) GA2.

Further information on the management of riparian wet grassland habitats can be found in 'Floodplain Meadows – Beauty and Utility: A Technical Handbook' (Rothero, et al., 2016)

Note on 'Dry meadows and grassy verges GS2'

This valuable habitat was noted in an area adjacent to and accessible from Ballybrack Woods. This area is subject to planning permission for a housing development.

Semi-natural woodland

The quality and condition of woodland habitats found within Ballybrack Woods is quite varied. There are many sections of (Mixed) broadleaved woodland WD1 that could be managed over time to revert to Oak-ash-hazel WN2, Wet pedunculate oak-ash WN4, or Wet willow-ash-alder WN6 woodland types.

The main semi-natural woodland types are WN6 along the valley floor and WN4 away from the river itself. Further up the valley the woodland begins to take the form of WN2 along the upper sides of the valley.

Another interesting wooded feature is the beech treeline (WL2/BL2) which is a continuous feature within the upper valley sections of WN6 and WN4 woodland. It is also found in along the river near Ardarrig Park.

Note on 'Oak-ash-hazel woodland WN2'

WN2 was not mapped as part of the survey. However, pockets of WN4 woodland appear to be transitioning into this habitat type further up the valley, away from the wet areas, typically along the valley sides. In these places the soil type is likely base-rich because of nearby agricultural practices and run-off. A mixture of Pedunculate Oak, Ash and Hazel make up the canopy. Because the extent of this WN2 like woodland is limited and narrow, there was not enough of the habitat for it to be mapped separately.

From visits to other nearby woodlands, it is possible that WN2 habitat type occurs further up the valley outside of the area surveyed (See map 6).

WD1 woodland types mapped throughout the Ballybrack Woods, may have originally been WN2 prior to human modification. Future management of these woodlands should take this into consideration.

Management of scrub

Scrub WS1 occurs in the Ballybrack Woods as successional habitat between grassland and woodland habitat types. Scrub is typically associated with changes in landscape management practices and is therefore a habitat type dependent on management; otherwise it eventually becomes established woodland. Scrub can be a very important habitat for biodiversity, especially because of the mosaic of smaller habitats that can be found within its structure (Mortimer, et al., 2000).

Further consideration should be given to managing scrub in the Ballybrack Woods. Guidance can be obtained from The Scrub Management Handbook (Day, et al., 2003).

Geology

The bedrock that the Douglas area sits on is primarily of the Old Red Sandstone type and this is particularly true for Ballybrack Woods and the catchments of the streams that run into it. The soil, where it has not been built on, is mainly acidic mineral (GSI, 2019).

Hydrology

In Ballybrack Woods three streams join progressively to form a single waterbody. Two small streams to the south east of the wood with EPA (Environmental Protection Agency) codes 19M30 and 19D59 join to form a larger water body with EPA code 19M30. This in turn joins with a stream –EPA code 19D64- that enters Ballybrack Woods below the pedestrian entrance to the wood from Donnybrook Hill (R851) to form a water body with EPA code 19M30 that flows north through and out of the wood. See Table 1 below for details of these water bodies. The main section of stream running through Ballybrack Woods is named locally as Ballybrack Stream.

These watercourses are not currently monitored as part of EPA water quality monitoring (EPA, 2019). At time of writing the map section of the website catchments.ie which, amongst other roles, provides data relating to the Water Framework Directive, shows that the risk status for these three waterbodies is 'review'. This means they have *'have insufficient information to determine the risk or have had measures implemented but some additional monitoring is required to confirm that the expected improvements have been achieved'*. Risk status refers to the risk of not achieving good water quality under the terms of the Water Framework Directive. (catchments.ie, 2019).

During field work as part of this action plan it was noted that bank reinforcement or alteration as part of previous and ongoing works included the insertion of large limestone boulders along sections. Limestone is generally alkaline whereas the parent rock from where streams in Ballybrack Woods arise is generally acidic. This may have an impact on the ecology of the stream. At the time of writing major diversion of the stream course and excavation of the stream body was underway at the north end of Ballybrack Woods in connection with flood relief work.

A 2017 Environmental Impact Statement (EIS) in connection with, at that time proposed, flood relief work for the Douglas area also refers to Brown Trout in the streams through Ballybrack Woods. This EIS quotes staff at Inland Fisheries Ireland staff describing the stream network here as ‘an important community resource’ (ARUP, 2017).

| | | | | | |
|---------------------|----------------|------------|----------------|------------|----------------|
| Segment Code | 19_1468 | 19_1367 | 19_1783 | 19_1817 | 19_1900 |
| EPA Name | Moneygurney 19 | Douglas 19 | Moneygurney 19 | Donnybrook | Moneygurney 19 |
| EPA Code | 19M30 | 19D59 | 19M30 | 19D64 | 19M30 |
| Stream Order | 1 | 1 | 2 | 3 | 3 |

Table 2 EPA watercourse segments running through Ballybrack Woods

On the Historic Map 25-inch layer from the OSI website (osi.ie, 2019) a spring is indicated in approximately the location between where Cois Coillte apartments are today and the Carrigaline Road, R855. On the 6-inch Cassini layer of the same site this is named as ‘Harding’s Well’. The Groundwater Wells and Springs layer of the GSI maps page (GSI, 2019) indicated at least two wells sunk in the area of the woods in the late 19th century.

Biodiversity Actions

The actions listed in this plan have been produced based on the following:

1. Desktop research by Wild Work
2. Consultation with other relevant stakeholders as appropriate.

Land ownership and necessary approval considerations

No actions listed in this plan should be undertaken without prior agreement being sought from the landowner(s).

Where necessary approvals should also be sought from bodies such as:

- National Monuments
- National Parks and Wildlife Service
- Office of Public Works
- Port of Cork
- Inland Fisheries
- Cork County Council
- Cork City Council
- Etc.

Identified actions are presented in Tables 3 and 4 below. These are expanded on in subsequent tables.

| ACTION NO. | THEME AREA |
|--|---|
| BATS | |
| 1 | Maintain habitat for the benefit of bats. |
| 2 | Monitor lighting management along cycle track and ensure that any future artificial lighting in the wood is bat-friendly. |
| EDUCATION, AWARENESS, COMMUNICATION | |
| 3 | Tell the story of nuisance native weeds such as ragwort, thistles and docks. How they can be a hindrance in farming but are of biodiversity value in the woods. |
| 4 | Erect interpretative signage and information for features of biodiversity interest e.g. streams, grassland, woodlands, species present. |
| 5 | Run education sessions with members of the public to encourage and help them to get actively involved with the plan. |
| 6 | Invest substantial effort into communicating the story of the Biodiversity Action Plan. |
| 7 | Help visitors to the woods to learn about the actions taking place. |
| 8 | Enable involvement and participation of the community through education and awareness sessions. |
| INVASIVE SPECIES | |
| 9 | Increase awareness of invasive species. |
| 10 | Ensure those responsible for managing and maintaining the woods do not cause unnecessary spread of invasive species. |
| 11 | Develop and implement a management plan for invasive species such as Japanese Knotweed, Winter Heliotrope, Traveller's Joy and Cherry Laurel. |
| MONITORING | |
| 12 | Set up and implement a bumblebee monitoring programme. |
| 13 | Set up and implement a butterfly monitoring programme. |
| 14 | Input biodiversity records into the National Biodiversity Data Centre's system. |
| POLLINATOR PROJECT | |
| 15 | Create solitary bee nesting sites on the east facing hill where woodland was recently cleared. |
| 16 | Log pollinator friendly activity onto the Actions for Pollinators website. |
| 17 | Eliminate inappropriate use of chemical herbicides in all parts of the woods. |
| 18 | Encourage reduced use of chemical herbicides in other parts of Douglas, such as gardens near the woods. |
| 19 | Plant native wildflowers in suitable locations, such as entrances to the woods |
| 20 | Manage dry grasslands to facilitate bumblebee nesting. |

Table 3 Actions 1-20.

| ACTION NO. | THEME AREA |
|--|---|
| RESEARCH AND SURVEY | |
| 21 | Oak woodland to be further surveyed to investigate its biodiversity value. |
| 22 | Carry out further research / survey work on bats. |
| 23 | Carry out further research / survey work on squirrels. |
| 24 | Carry out further research / survey work on fish. |
| 25 | Carry out further research / survey work on aquatic invertebrates. |
| 26 | Carry out further research / survey work on Otters. |
| 27 | Carry out further research / survey work on mosses, liverworts and lichens. |
| TRACKING THE PLAN'S PERFORMANCE AND SUCCESS | |
| 28 | Set key performance indicators for each action (as appropriate). |
| 29 | Complete an annual report for each year of the plan to showcase performance. |
| 30 | Track the number of additional actions that happen as a result of the plan, i.e. throughout the rest of the community. |
| WATERCOURSES | |
| 31 | Facilitate the watercourses running through the woods to behave in a natural way. |
| 32 | Consider implications for watercourses when implementing any actions. |
| 33 | Develop and implement a water quality monitoring programme for streams through the woods. |
| WOODLAND | |
| 34 | Manage the woodland habitats of the woods to help them revert to their natural state. |
| 35 | Develop and implement a management plan for appropriate sections of WD1 (Mixed) broadleaved woodland to revert to WN2 Oak-ash-hazel woodland. |
| 36 | Restore woodland that was clear-felled as part of the 2017 cycleway extension, preferably as woodland types WN2, WN4 or WN6 as appropriate. |
| 37 | Develop and implement a policy to prevent the unnecessary removal of mature native tree species. |
| 38 | Produce a specification for how best to manage scrub habitats. |
| GRASSLAND | |
| 39 | Continue to manage grassland within Ballybrack Woods according to current management plan. |
| PRESERVE EXISTING BIODIVERSITY FEATURES | |
| 40 | Preserve the sandstone quarry / cliff features. |
| 41 | Manage wet grassland habitats appropriately for wildlife. |

Table 4 Actions 21-41.

| Action No. | Suggested timeframe to undertake action | | | | | Suggested 5-year budget to undertake action | | |
|------------|---|--------|--------|--------|--------|---|----------|---------|
| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Up to 1k | Up to 5k | 5k plus |
| 1 | | • | • | • | | • | | |
| 2 | • | • | • | • | • | | | • |
| 3 | • | • | • | • | • | • | | |
| 4 | • | • | • | • | • | | • | |
| 5 | • | • | • | • | • | • | | |
| 6 | • | • | • | • | • | • | | |
| 7 | • | • | • | • | • | • | | |
| 8 | • | • | • | • | • | • | | |
| 9 | • | • | • | • | • | • | | |
| 10 | • | • | • | • | • | • | | |
| 11 | • | • | • | • | • | | | • |
| 12 | • | • | • | • | • | • | | |
| 13 | • | • | • | • | • | • | | |
| 14 | • | • | • | • | • | | | |
| 15 | • | • | • | | | • | | |
| 16 | • | • | • | • | • | | | |
| 17 | • | • | • | • | • | | | |
| 18 | • | • | • | • | • | | | |
| 19 | • | • | • | • | • | • | | |
| 20 | • | • | • | • | • | • | | |
| 21 | • | • | | | | • | | |
| 22 | • | • | • | • | • | • | | |
| 23 | • | • | • | • | • | • | | |
| 24 | • | • | • | • | • | • | | |
| 25 | • | • | • | • | • | • | | |
| 26 | • | • | • | • | • | • | | |
| 27 | • | • | • | • | • | • | | |
| 28 | • | | | | | | | |
| 29 | • | • | • | • | • | • | | |
| 30 | • | • | • | • | • | | | |

Table 5 Suggested timeframes and costings for actions 1-30.

| Action No. | Suggested timeframe to undertake action | | | | | Suggested 5-year budget to undertake action | | |
|------------|---|--------|--------|--------|--------|---|----------|---------|
| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Up to 1k | Up to 5k | 5k plus |
| 31 | • | • | • | • | • | | | |
| 32 | • | • | • | • | • | | | |
| 33 | • | • | • | • | • | | • | |
| 34 | • | • | • | • | • | • | | |
| 35 | • | • | • | • | • | • | | |
| 36 | • | • | • | • | • | • | | |
| 37 | • | • | | | | • | | |
| 38 | • | | | | | • | | |
| 39 | • | • | • | • | • | | | • |
| 40 | • | • | • | • | • | | | |
| 41 | • | • | • | • | • | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Table 6 Suggested timeframes and costings for actions 31-41.

| Action No. | Seasonality and/or timing a factor | Wild Work or other expertise required | Suitable for involvement of volunteers etc. | Once-off | Ongoing | Additional permissions required |
|------------|------------------------------------|---------------------------------------|---|----------|---------|---------------------------------|
| 1 | | • | | | • | |
| 2 | | • | | | • | • |
| 3 | | • | | | • | |
| 4 | | • | | | • | • |
| 5 | | • | | | • | |
| 6 | | • | | | • | |
| 7 | | • | | | • | |
| 8 | | • | | | • | |
| 9 | | • | | | • | |
| 10 | | | | | • | |
| 11 | | • | | | • | |
| 12 | • | • | • | • | | |
| 13 | • | • | • | • | | |
| 14 | | • | • | | • | |
| 15 | • | • | | • | | • |
| 16 | | | • | | • | |
| 17 | | | | | • | |
| 18 | | | | | • | |
| 19 | | • | • | • | | |
| 20 | • | • | | | • | |
| 21 | • | • | • | • | • | |
| 22 | • | • | • | | • | • |
| 23 | • | • | • | | • | |
| 24 | • | • | • | | • | • |
| 25 | • | • | • | | • | • |
| 26 | • | • | • | | • | • |
| 27 | • | • | • | | • | |
| 28 | | | | | | |
| 28 | | | | • | | |
| 30 | | | | | • | |

Table 7 Further considerations for actions 1-30.

| Action No. | Seasonality and/or timing a factor | Wild Work or other expertise required | Suitable for involvement of volunteers etc. | Once-off | Ongoing | Additional permissions required |
|------------|------------------------------------|---------------------------------------|---|----------|---------|---------------------------------|
| 31 | | • | | | | |
| 32 | | • | | | • | |
| 33 | • | • | • | | • | • |
| 34 | | • | | | • | |
| 35 | | • | | | • | |
| 36 | | • | | | • | |
| 37 | | • | | • | | |
| 38 | | • | | • | | |
| 39 | • | • | | | • | • |
| 40 | | | | | • | |
| 41 | • | • | | | • | |

Table 8 Further considerations for actions 31-41.

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Appendix I

Further information related to the actions

Helping biodiversity and helping people

Biodiversity action plans usually consider the needs of flora and fauna in isolation and as something separate to human needs.

Wild Work's motto of helping people, help nature, help people is about recognising that people want to help nature and that people can benefit in doing so. If we help nature, we can also help ourselves and our communities; particularly in terms health and well-being.

For example, developing and managing woodlands as spaces for people to exercise and play, but while also prioritising the need to manage the woodland for the benefit of the species of flora and fauna that live there.

Actions included in this plan take this concept into consideration.

Douglas Tidy Towns Pollinator Actions

Douglas Tidy Towns have embraced the All Ireland Pollinator Plan and have already developed a Pollinator Garden in Douglas Community Park and planted pollinator friendly trees and plants in the community. As well as promoting pollinator friendly actions through their social media, Douglas Tidy Towns have organised educational sessions based around the All Ireland Pollinator Plan.

Details of the All Ireland Pollinator Project can be found here:

<http://www.biodiversityireland.ie/projects/irish-pollinator-initiative/all-ireland-pollinator-plan/resources/>

Wild Work Pollinator Project

Some actions that will be listed in this plan are of relevance to Wild Work's Pollinator Project. The project is in support of the All-Ireland Pollinator Plan.

Pollinators play a key role in our ecosystems; providing pollination services for wildflowers and crops to ensure successful seed and fruit production and with helping us monitor the overall health of our countryside.

In Ireland, our main pollinator species include: 1 honeybee species; 20 bumblebee species; 77 solitary bee species; and 180 hoverfly species. 33% of our native bumblebee species, 43% of our native solitary bee species and 20% of our native hoverfly species are threatened with extinction. This is due to hunger, homelessness, poisoning and other factors (NBDC, 2015)

Examples of pollinator friendly landscape management include:

- Conversion of lawn area to managed wildflower meadow
- Planting of native wildflower strips
- Creation of nesting sites for solitary bees.

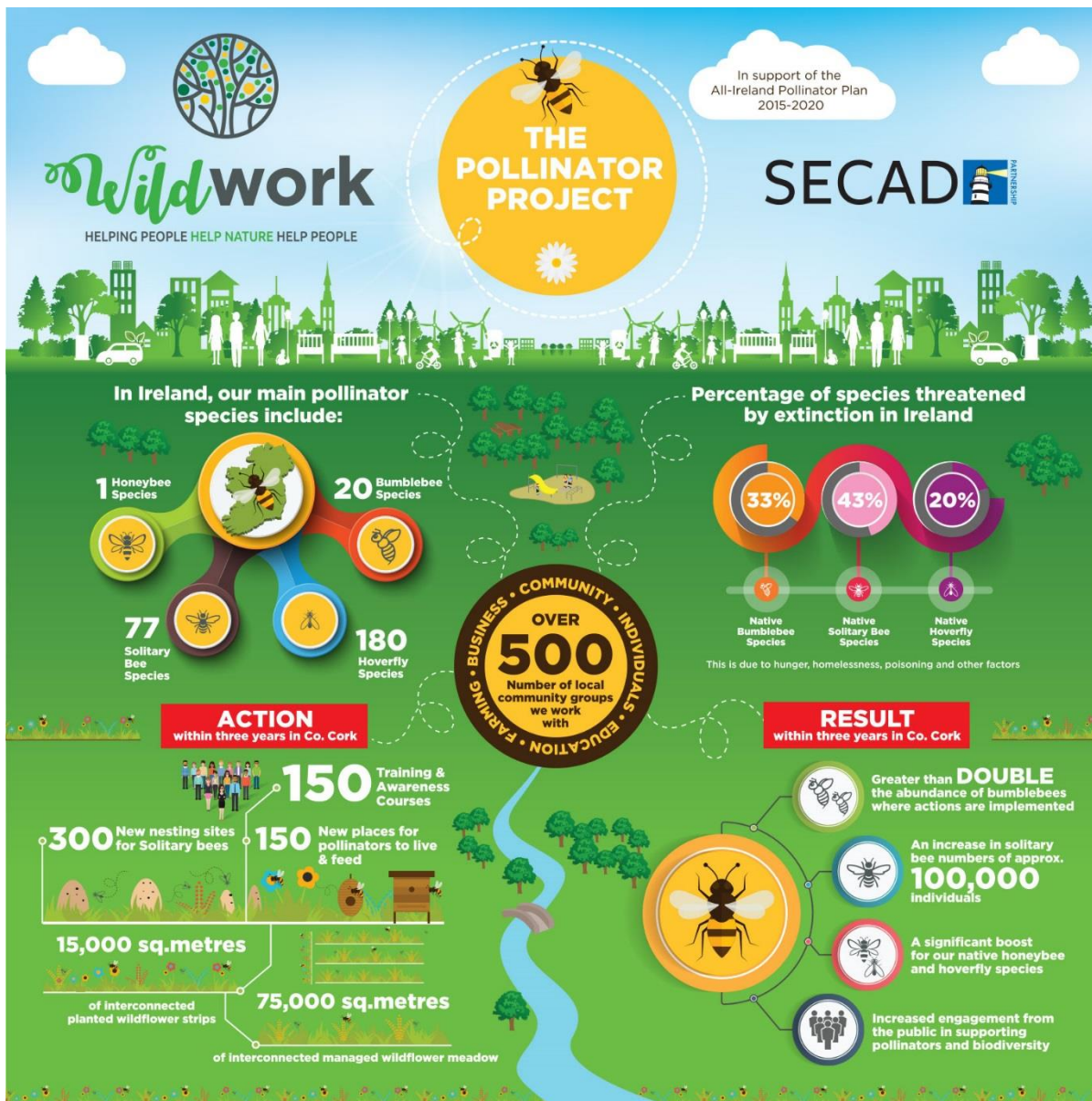


Figure 1 - Wild Work Pollinator Project info

General principles

The following general principles should be followed in the implementation of any actions included in this Biodiversity Action Plan:

1. Always preserve features of high conservation value.
2. Use native species whenever planting/sowing.
3. Try to fully understand the habitats and flora and fauna species already associated with the given location.
4. Consult with a qualified ecologist such as Wild Work staff to learn how to implement best practice.
5. Work with, rather than against nature, to make biodiversity enhancement more efficient.
6. Cease using herbicides, insecticides, fungicides and any other pesticides or chemicals where possible.
 - For example, there is no need to use herbicide to maintain border edges of green areas. This task can be carried out quite easily either with a manual hoe or shovel, or use of strimming equipment.
7. Follow Sustainable Use Directive guidelines if applying any pesticides.
8. Wild can be beautiful. Always strive to make places aesthetically pleasing, so that others will be inspired to copy your good example.
9. Try to understand the big picture and be aware that some actions considered to be beneficial may not always be of benefit to biodiversity and nature in every setting.
 - For example, planting trees is usually a good idea, but not if we are trying to protect a rare grassland and its associated fauna. There are plenty of other examples...
10. Remember that people can benefit from biodiversity, as much as biodiversity can benefit from people; Help people, to help nature, to help people...

Note on Irish environmental law

In terms of legislation that protects areas of biodiversity value in Ireland, there are four main types of categories that people should be aware of: proposed Natural Heritage Areas (pNHA's) and Natural Heritage Areas (NHA's) under the Irish Wildlife Act (Irish Statute Book, 1976); and Special Protection Areas (SPA's) and Special Areas of Conservation (SAC's) transposed into Irish law under the European Communities (Birds and Habitats Regulations) 2011 (Irish Statute Book, 2011). In addition to regulations concerning the protection of habitats, species and sites of conservation importance, European Communities (Birds and Habitats Regulations) 2011 (Irish Statute Book, 2011) also contains regulations related to the sale, distribution and dispersal of invasive species.

Further details are available on the National Parks and Wildlife Service website, the most relevant of which can be found at this link: <https://www.npws.ie/protected-sites/nha>

'NAMA fields'

Stretching over as far as Douglas Golf Club (see Habitat Map 5 in Appendix II), an area known locally as the 'NAMA Fields' is likely to be important for local biodiversity. There is a mixture of Dry meadows and grassy verges GS2, Scrub WS1, Hedgerow WL1, Treeline WL2, and Recolonising bare ground ED3 habitats. The 'NAMA Fields' are earmarked for development. There is an opportunity to incorporate these biodiversity features of interest as part of any such development. Ballybrack Woods has a walkway / cycleway through it. There is a planned extension of this, part of which will be through the 'NAMA fields'.

Appendix II

Habitat mapping

Further details of habitat mapping can be obtained from:

Douglas Tidy Towns Biodiversity Action Plan Phase 1: Habitat mapping report for Ballybrack Woods (The Mangala) Prepared by: William O'Halloran and Finbarr Wallace, Wild Work, 15/12/17

Available from Douglas Tidy Towns.

Habitat maps

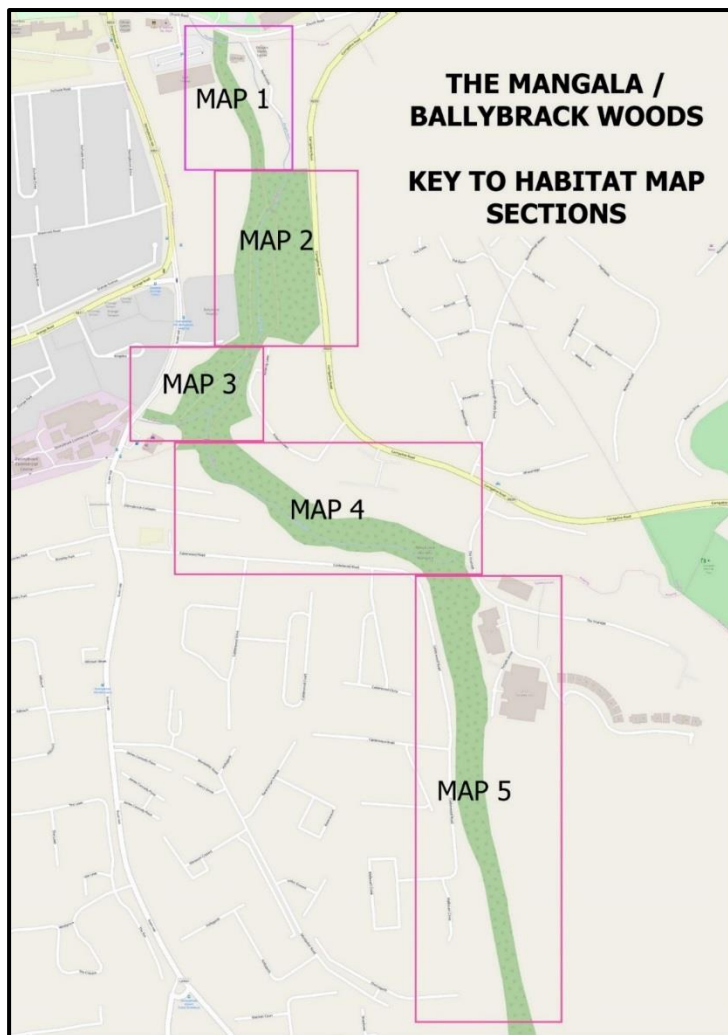
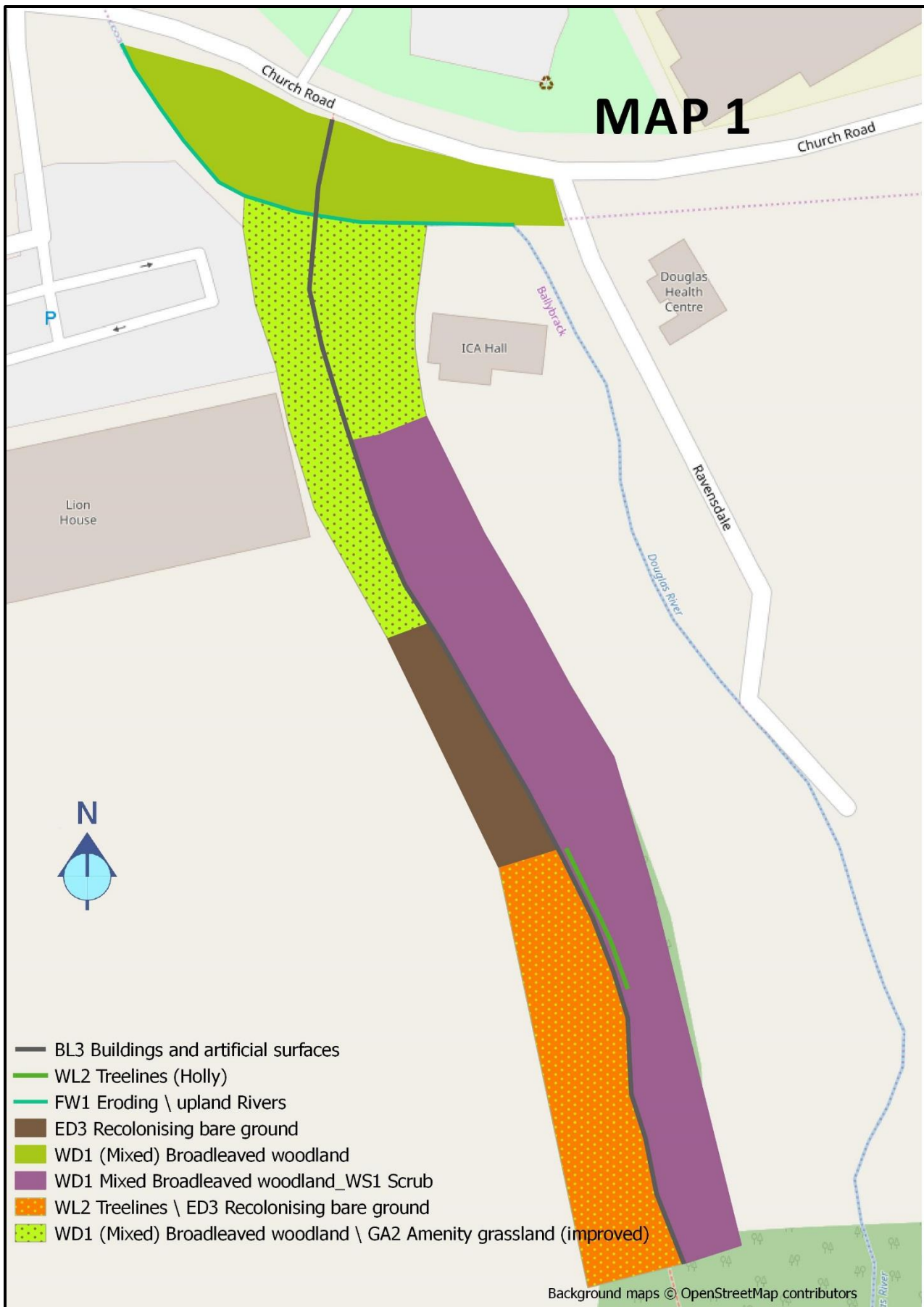
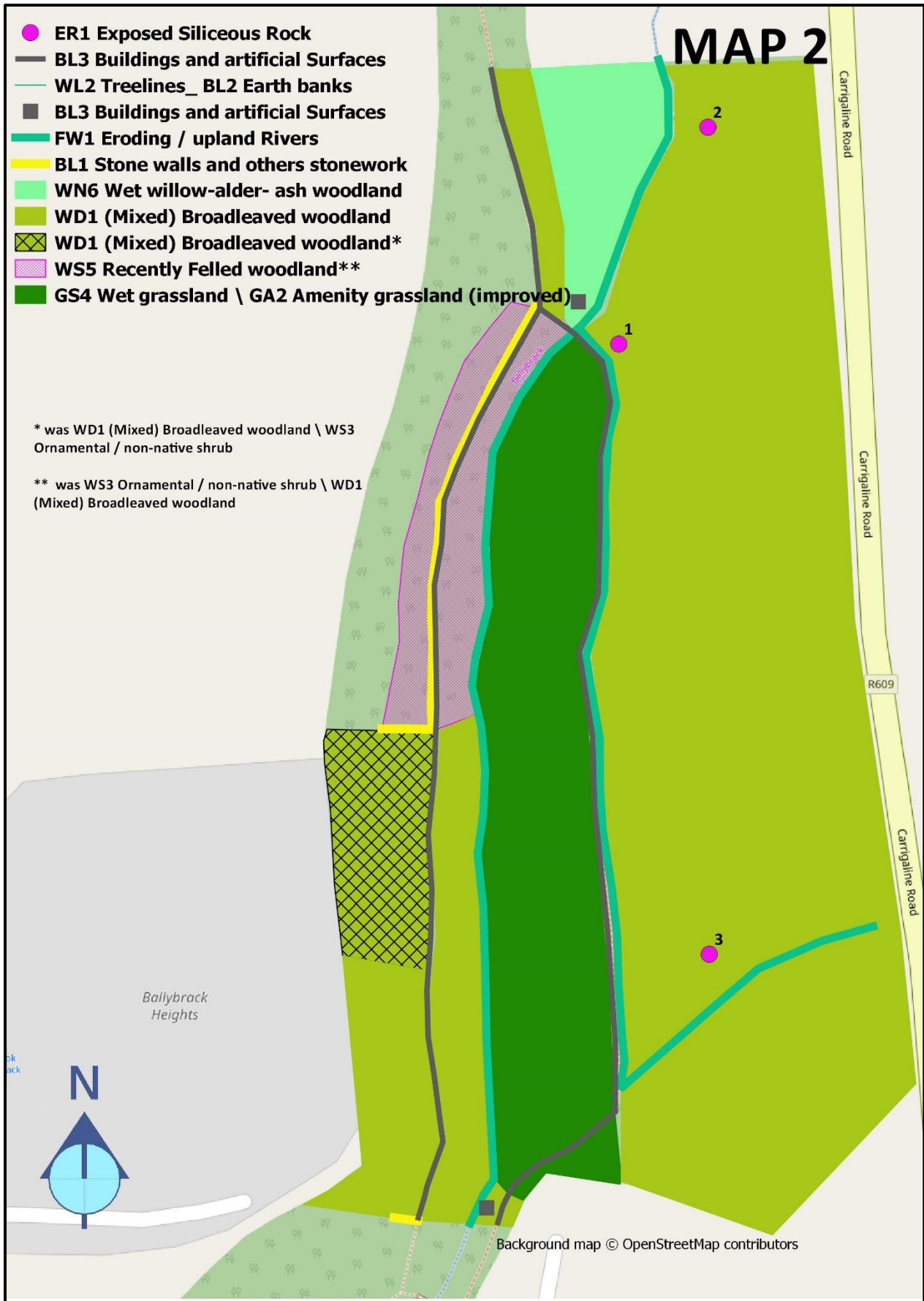


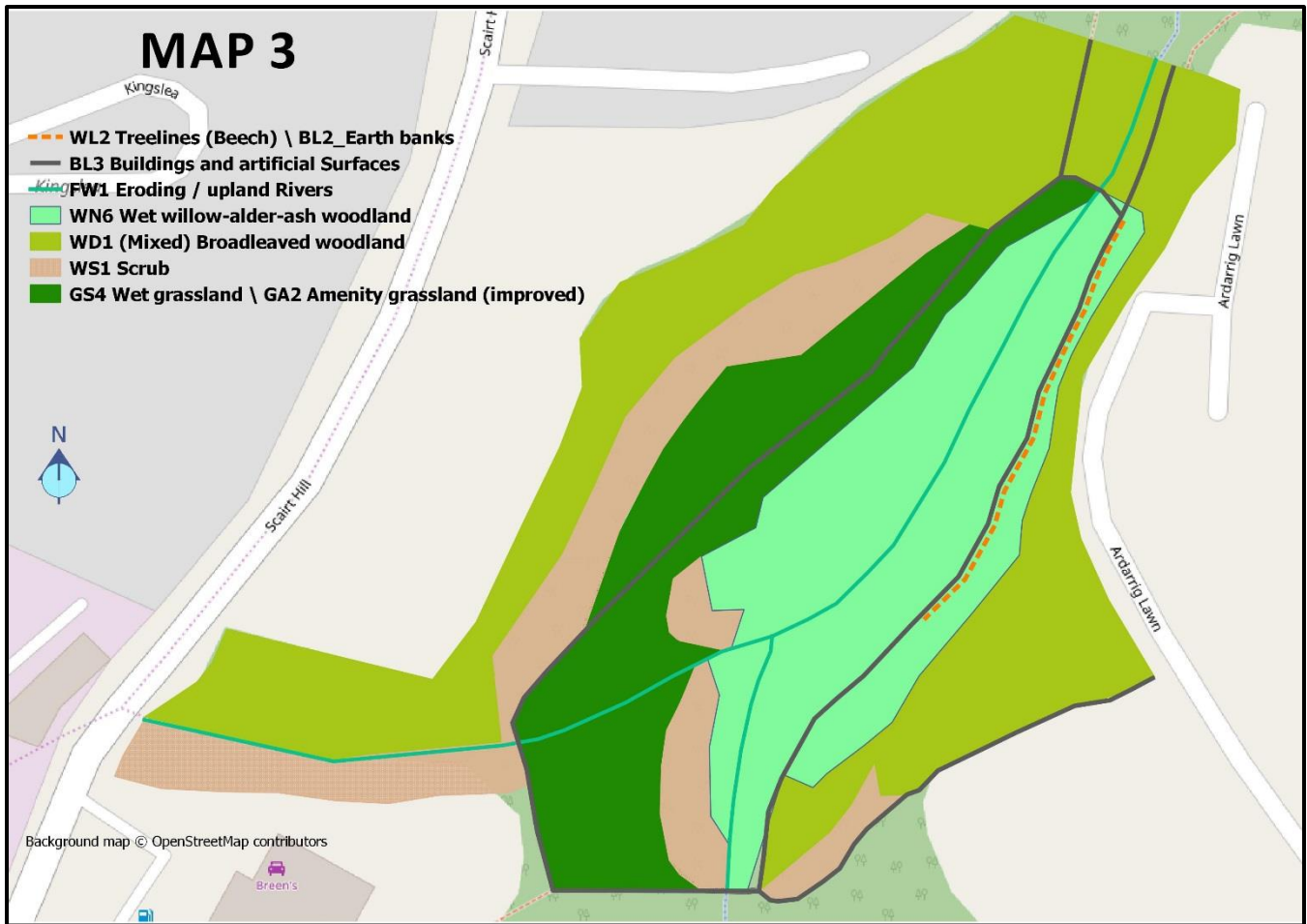
Figure 2 Key to habitat map sections



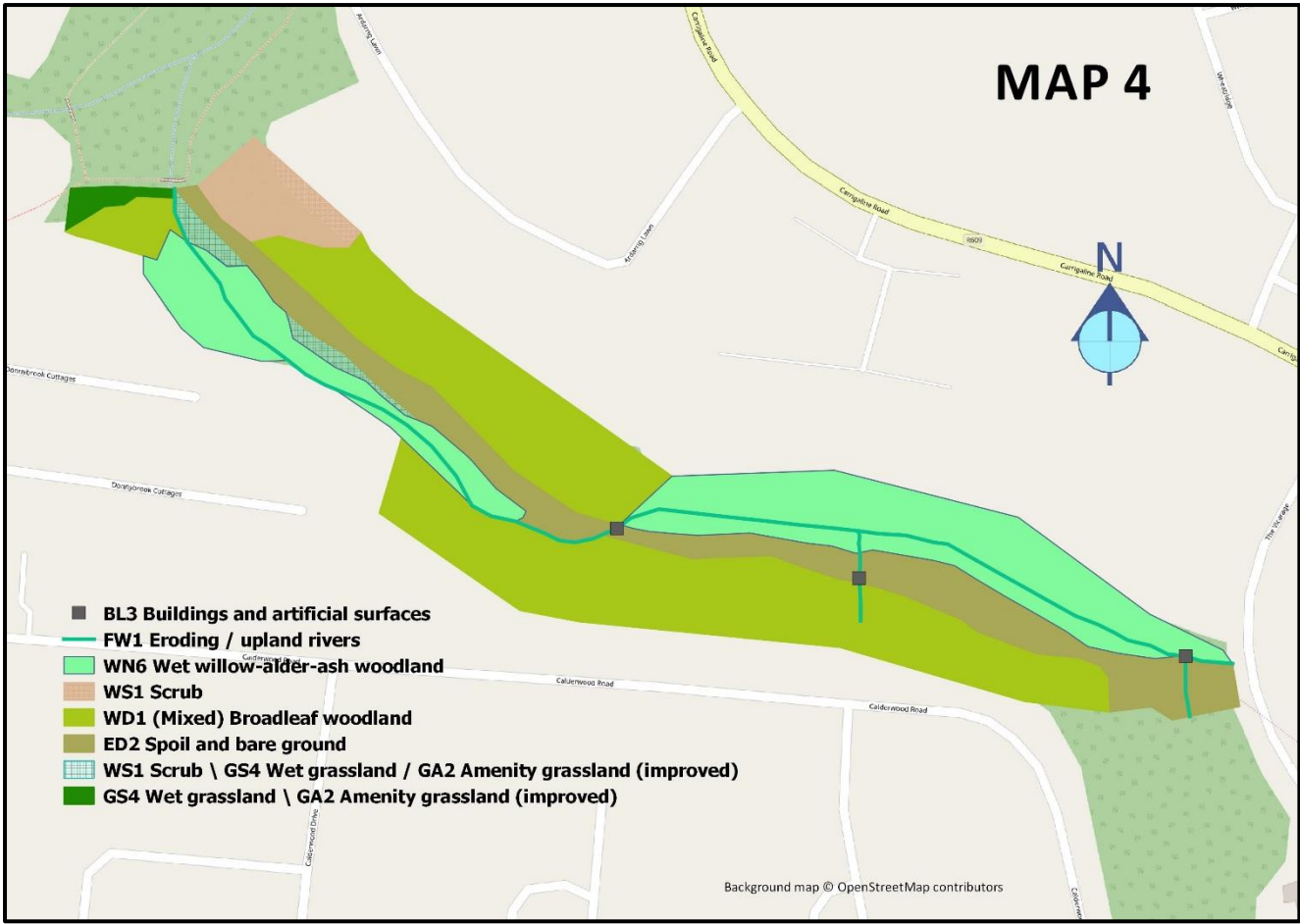
Map 1



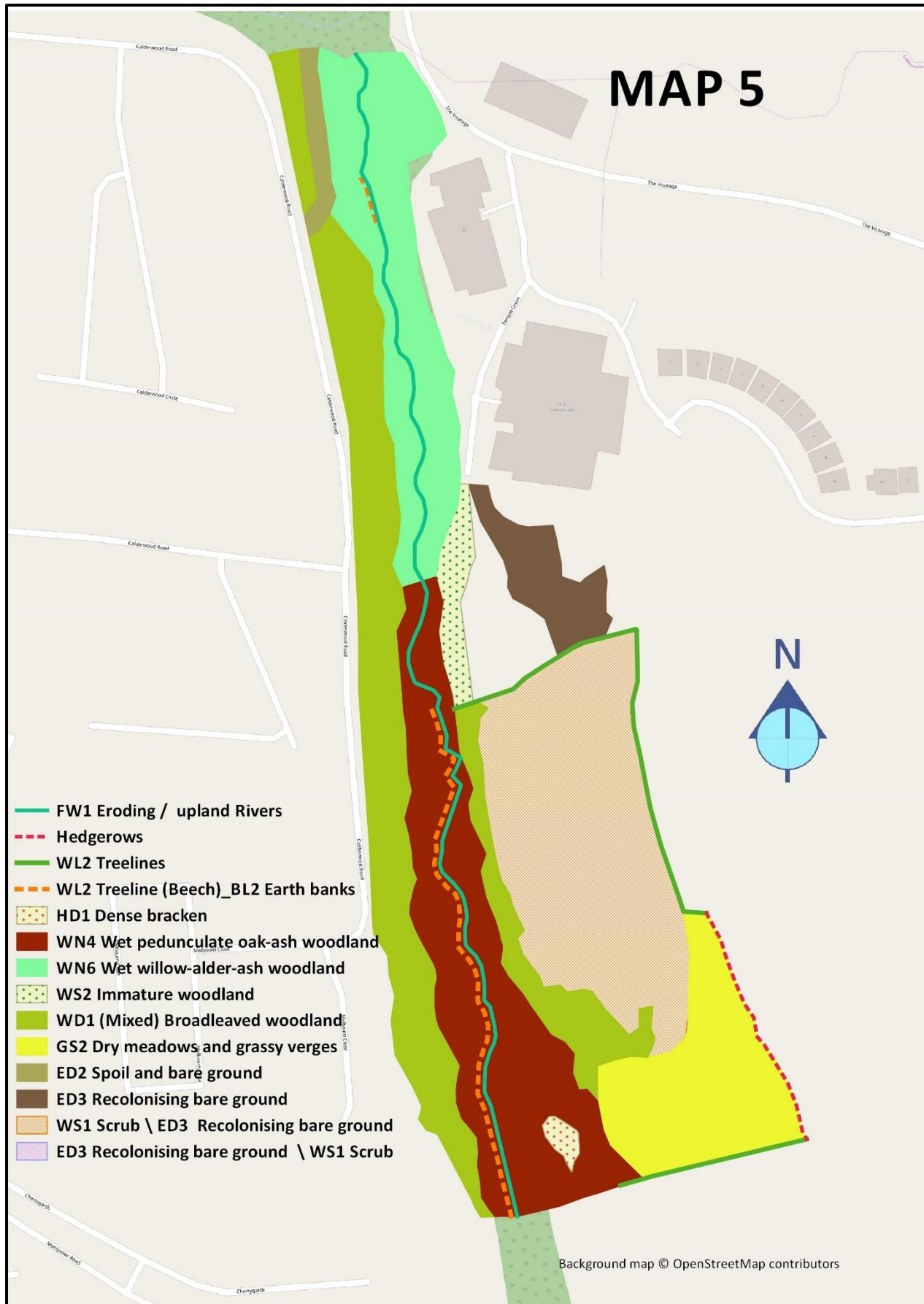
Map 2



Map 3



Map 4



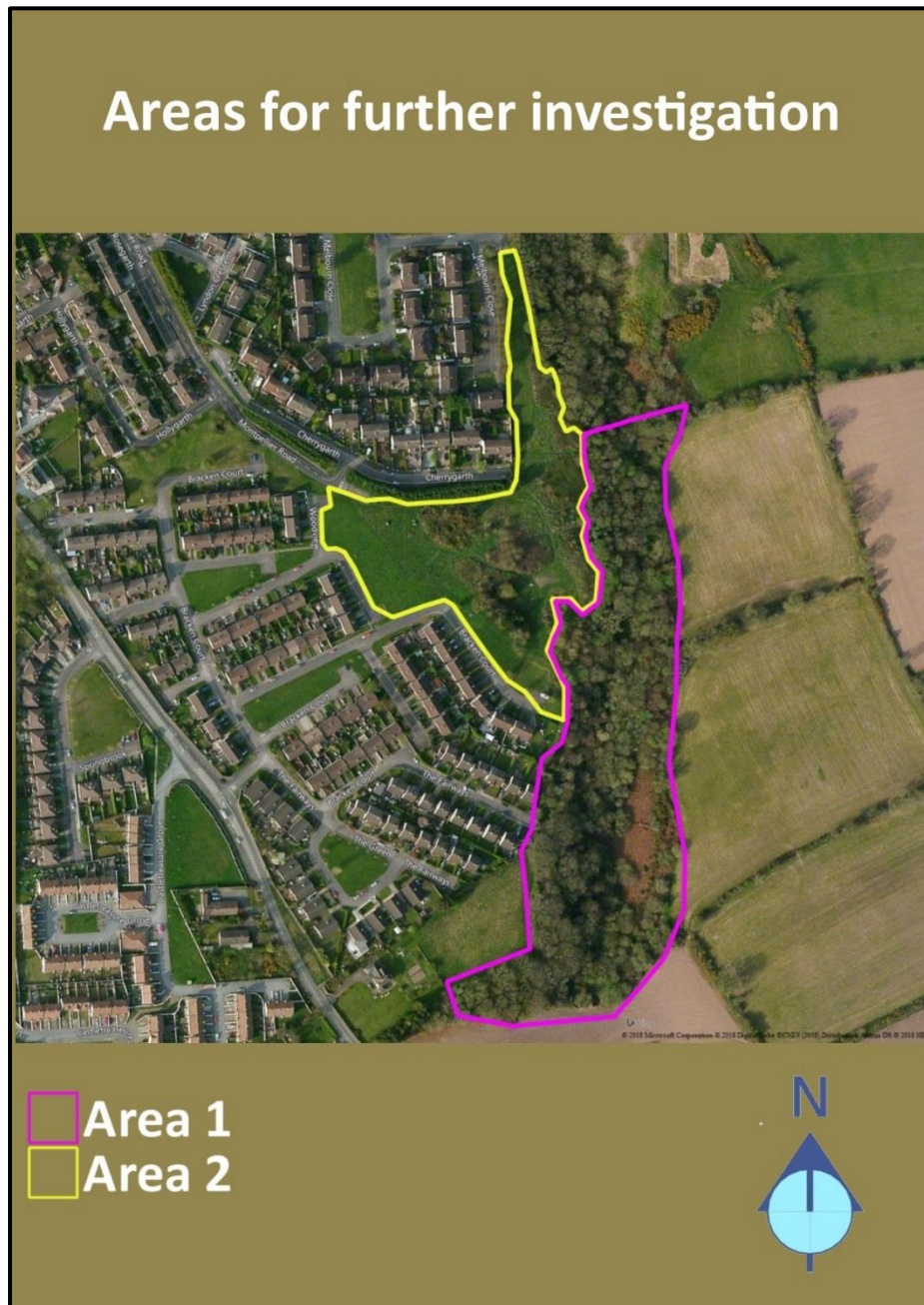
Map 5

Areas for further investigation identified in the Habitat Mapping report

Semi-natural woodland occurs further up the valley from the Mangala (see area 1, map 6).

There is another interesting looking area of grassland/scrub (see area 2, map 6).

Neither of these areas were habitat mapped as they were outside of the scope of the survey. However, they are likely to be important for biodiversity locally and warrant further investigation.



Map 6

Appendix III

Flora and fauna

Flora recorded during habitat mapping

| FORBS - table 1 of 4 | |
|------------------------|----------------------------------|
| Common Name | Latin Name |
| Balm* | <i>Melissa officinalis</i> * |
| Barren strawberry | <i>Potentilla sterilis</i> |
| Bilbao fleabane* | <i>Conyza bilbaoana</i> * |
| Bittercress, Wavy | <i>Cardamine flexuosa</i> |
| Black medick | <i>Medicago lupulina</i> |
| Bluebell | <i>Hyacinthoides non-scripta</i> |
| Broad-leaved dock | <i>Rumex obtusifolius</i> |
| Brooklime | <i>Veronica beccabunga</i> |
| Bugle | <i>Ajuga reptans</i> |
| Burdock | <i>Arctium minus</i> |
| Bush vetch | <i>Vicia sepium</i> |
| Cats-ear | <i>Hypochaeris radicata</i> |
| Chickweed (common) | <i>Stellaria graminea</i> |
| Cleavers | <i>Galium aparine</i> |
| Common dog-violet | <i>Viola riviniana</i> |
| Common mouse-ear | <i>Cerastium fontanum</i> |
| Common nettle | <i>Urtica dioica</i> |
| Common sorrel | <i>Rumex acetosa</i> |
| Common spear-thistle | <i>Cirsium vulgare</i> |
| Common speedwell* | <i>Veronica persica</i> * |
| * = non-native species | |

| FORBS - table 2 of 4 | |
|---|--|
| Common Name | Latin Name |
| Creeping Buttercup | <i>Ranunculus repens</i> |
| Creeping thistle | <i>Cirsium arvense</i> |
| Curled dock | <i>Rumex crispus</i> |
| Cuckoo flower | <i>Cardamine pratensis</i> |
| Cut-leaved cranesbill* | <i>Geranium dissectum*</i> |
| Daffodil* | <i>Narcissus sp.*</i> |
| Daisy | <i>Bellis perennis</i> |
| Dandelion | <i>Taraxacum agg.</i> |
| Duckweed | <i>Lemna sp</i> |
| Enchanters nightshade | <i>Circaea lutetiana</i> |
| Field forget-me-not | <i>Myosotis arvensis</i> |
| Fools watercress | <i>Apium nodiflorum</i> |
| Foxglove | <i>Digitalis purpurea</i> |
| Garden yellow archangel* | <i>Lamiastrum galeobdolon subsp. argentatum***</i> |
| Germander speedwell | <i>Veronica chamaedrys</i> |
| Great willowherb | <i>Epilobium hirsutum</i> |
| Greater birds-foot trefoil | <i>Lotus pedunculatus</i> |
| Greater plantain | <i>Plantago major</i> |
| Greater stitchwort | <i>Stellaria holostea</i> |
| Groundsel | <i>Senecio vulgaris</i> |
| Hedge mustard | <i>Sisymbrium officinale</i> |
| Hedge woundwort | <i>Stachys sylvatica</i> |
| Herb robert | <i>Geranium robertianum</i> |
| Himalayan honeysuckle** | <i>Leycesteria formosa**</i> |
| Hogweed | <i>Heracleum sphondylium</i> |
| Ivy-leaved toadflax* | <i>Cymbalaria muralis*</i> |
| * = non-native species ** = invasive species listed in (NBDC, 2013) | |
| *** Not listed as invasive but authors have observed this as invasive in Co. Cork and there is anecdotal evidence of problems elsewhere. | |

| FORBS - table 3 of 4 | |
|--|--------------------------------------|
| Common Name | Latin Name |
| Japanese knotweed** | <i>Fallopia japonica</i> ** |
| Knapweed | <i>Centaurea nigra</i> |
| Lesser celandine | <i>Ficaria verna</i> |
| Lesser trefoil | <i>Trifolium dubium</i> |
| Lords and ladies | <i>Arum maculatum</i> |
| Marsh thistle | <i>Cirsium palustre</i> |
| Meadow buttercup | <i>Ranunculus acris</i> |
| Meadowsweet | <i>Filipendula ulmaria</i> |
| Montbretia* | <i>Crocsmia × crocosmiiflora</i> * |
| Nipplewort | <i>Lapasana communis</i> |
| Opposite leaved golden saxifrage | <i>Chrysosplenium oppositifolium</i> |
| Periwinkle (lesser)* | <i>Vinca minor</i> * |
| Periwinkle (intermediate)* | <i>Vinca difformis</i> * |
| Periwinkle (greater)* | <i>Vinca major</i> * |
| Pignut | <i>Conopodium majus</i> |
| Prickly sow-thistle | <i>Sonchus asper</i> |
| Quince (flowering)* | <i>Chaenomeles sp.</i> * |
| Ragwort | <i>Senecio jacobaea</i> |
| Red bartsia | <i>Odontites vernus</i> |
| Red clover | <i>Trifolium pratense</i> |
| Red dead-nettle | <i>Lamium purpureum</i> |
| Ribwort plantain | <i>Plantago lanceolata</i> |
| Russian comfrey* | <i>Symphytum x uplandicum</i> * |
| Shepherd's purse | <i>Capsella bursa-pastoris</i> |
| * = non-native species ** = invasive species listed in (NBDC, 2013) | |

| FORBS - table 4 of 4 | |
|-------------------------------|---|
| Common Name | Latin Name |
| Silverweed | <i>Potentilla anserina</i> |
| Smooth sow-thistle | <i>Sonchus oleraceus</i> |
| Snowdrop* | <i>Galanthus sp.*</i> |
| Square stalked St. Johns-wort | <i>Hypericum tetrapterum</i> |
| Sticky mouse-ear | <i>Cerastium glomeratum</i> |
| Three-cornered garlic** | <i>Allium triquetrum**</i> |
| Trailing bellflower* | <i>Campanula poscharskyana*</i> |
| Tutsan | <i>Hypericum androsaemum</i> |
| Upright hedge-parsley | <i>Torilis japonica</i> |
| Valerian | <i>Valeriana officinalis</i> |
| Water figwort | <i>Scrophularia auriculata</i> |
| Water hemlock dropwort | <i>Oenanthe crocata</i> |
| Watercress | <i>Nasturtium officinale</i> |
| White clover | <i>Trifolium repens</i> |
| Wild angelica | <i>Angelica sylvestris</i> |
| Winter heliotrope** | <i>Petasites fragrans**</i> |
| Wood anemone | <i>Anemone nemorosa</i> |
| Wood avens | <i>Geum urbanum</i> |
| Wood dock | <i>Rumex sanguineus</i> |
| Wood sage | <i>Teucrium scorodonia</i> |
| Wood sorrel | <i>Oxalis acetosella</i> |
| Wood speedwell | <i>Veronica montana</i> |
| Yellow flag iris | <i>Iris pseudacorus</i> |
| * = non-native species | ** = invasive species listed in (NBDC, 2013) |

| GRASSES | |
|---------------------|--------------------------------|
| Common Name | Latin Name |
| Annual meadow-grass | <i>Poa annua</i> |
| Cocksfoot | <i>Dactylis glomerata</i> |
| Creeping bent | <i>Agrostis stolonifera</i> |
| Crested dogs-tail | <i>Cynosurus cristatus</i> |
| False oat-grass | <i>Arrhenatherum elatius</i> |
| False wood-brome | <i>Brachypodium sylvaticum</i> |
| Holcus lanatus | <i>Yorkshire fog</i> |
| Meadow foxtail | <i>Alopecurus pratensis</i> |
| Perennial rye-grass | <i>Lolium perenne</i> |
| Red fescue | <i>Festuca rubra</i> |
| Rough meadow-grass | <i>Poa trivialis</i> |
| Soft brome | <i>Bromus hordaceus</i> |
| Sweet-vernal grass | <i>Anthoxanthum odoratum</i> |

| FERNS AND ALLIES | |
|-------------------------|--------------------------------|
| Common Name | Latin Name |
| Bracken | <i>Pteridium aquilinum</i> |
| Broad buckler-fern | <i>Dryopteris dilatata</i> |
| Field horsetail | <i>Equisetum arvense</i> |
| Hard fern | <i>Blechnum spicant</i> |
| Hard fern | <i>Blechnum spicant</i> |
| Hart's tongue fern | <i>Asplenium scolopendrium</i> |
| Maidenhair spleenwort | <i>Asplenium trichomanes</i> |
| Scaly male fern | <i>Dryopteris affinis agg.</i> |
| Soft-shield fern | <i>Polystichum setiferum</i> |
| Wall-rue | <i>Asplenium ruta-muraria</i> |

| MOSSES | |
|------------------------|-------------------------------|
| Common Name | Latin Name |
| Common haircap moss | <i>Polytrichum commune</i> |
| Dotted thyme moss | <i>Rhizomnium punctatum</i> |
| Little shaggy moss | <i>Rhytidiadelphus loreus</i> |
| Swan's-neck thyme-moss | <i>Mnium hornum</i> |
| Tamarisk moss | <i>Thuidium tamariscinum</i> |

| WOOD RUSHES, SEDGES AND RUSHES | |
|---------------------------------------|-------------------------------------|
| Common Name | Latin Name |
| Great wood-rush | <i>Luzula sylvatica</i> |
| Grey sedge | <i>Carex divulsa subsp. divulsa</i> |
| Pendulous sedge | <i>Carex pendula</i> |
| Remote sedge | <i>Carex remota</i> |
| Wood sedge | <i>Carex sylvatica</i> |
| Hard rush | <i>Juncus inflexus</i> |
| Sharp-flowered rush | <i>Juncus acutiflorus</i> |
| Soft rush | <i>Juncus effusus</i> |

| CLIMBERS | |
|---|------------------------------|
| Common Name | Latin Name |
| Atlantic ivy | <i>Hedera hibernica</i> |
| Hedge bindweed | <i>Calystegia sepium</i> |
| Honeysuckle | <i>Lonicera periclymenum</i> |
| Old man's beard** | <i>Clematis vitalba**</i> |
| ** = invasive species listed in (NBDC, 2013) | |

| SHRUBS | |
|-------------------------------|---|
| Common Name | Latin Name |
| Bird Cherry** | <i>Prunus laurocerasus**</i> |
| Bramble | <i>Rubus fruticosus agg.</i> |
| Butterfly bush** | <i>Buddleja davidii**</i> |
| Elder | <i>Sambucus nigra</i> |
| Fuchsia* | <i>Fuchsia magellanica*</i> |
| Gorse | <i>Ulex europaeus</i> |
| Griselinia* | <i>Griselinia littoralis*</i> |
| Privet (garden)* | <i>Ligustrum ovalifolium*</i> |
| Rhododendron** | <i>Rhododendron ponticum**</i> |
| Snowberry* | <i>Symphoricarpos albus*</i> |
| Spotted laurel* | <i>Aucuba japonica*</i> |
| Wilson's honeysuckle* | <i>Lonicera nitida*</i> |
| * = non-native species | ** = invasive species listed in (NBDC, 2013) |

| TREES | |
|--|--------------------------------|
| Common Name | Latin Name |
| Alder | <i>Alnus glutinosa</i> |
| Ash | <i>Fraxinus excelsior</i> |
| Beech* | <i>Fagus sylvatica</i> * |
| Blackthorn | <i>Prunus spinosa</i> |
| Douglas fir* | <i>Pseudotsuga menziesii</i> * |
| Elm | <i>Ulmus sp.</i> |
| Hawthorn | <i>Crataegus monogyna</i> |
| Hazel | <i>Corylus avellana</i> |
| Holly | <i>Ilex aquifolium</i> |
| Norway maple* | <i>Acer platanoides</i> * |
| Pedunculate oak | <i>Quercus robur</i> |
| Scots pine* | <i>Pinus sylvestris</i> * |
| Sycamore** | <i>Acer pseudoplatanus</i> ** |
| Willow | <i>Salix sp.</i> |
| * = non-native species ** = invasive species listed in (NBDC, 2013) | |

Fauna associated with the Mangala

| Species group | Common name | Latin name | Recorded | Likely to occur |
|--|----------------------------|----------------------------------|----------|-----------------|
| Birds | Grey Heron | <i>Ardea cinerea</i> | x | |
| | Rook | <i>Corvus frugilegus</i> | x | |
| | Jackdaw | <i>Corvus monedula</i> | x | |
| | Robin | <i>Erithacus rubecula</i> | x | |
| | Blue Tit | <i>Parus caeruleus</i> | x | |
| | Great tit | <i>Parus major</i> | x | |
| | Coal Tit | <i>Parus ater</i> | x | |
| | Long-tailed Tit | <i>Aegithalus caudatus</i> | x | |
| | Chaffinch | <i>Fringilla coelebs</i> | x | |
| | Wren | <i>Troglodytes troglodytes</i> | x | |
| | Siskin | <i>Carduelis spinus</i> | x | |
| | Goldfinch | <i>Carduelis carduelis</i> | x | |
| | Jay | <i>Garrulus glandarius</i> | x | |
| | Magpie | <i>Pica pica</i> | x | |
| | Grey Wagtail | <i>Motacilla cinerea</i> | x | |
| | Pied Wagtail | <i>Motacilla alba yarrellii</i> | x | |
| | Pheasant* | <i>Phasianus colchicus*</i> | x | |
| | Treecreeper | <i>Certhia familiaris</i> | x | |
| | Wood Pigeon | <i>Columba palumbus</i> | x | |
| Mammals | Soprano Pippistrelle (bat) | <i>Pipistrellus pygmaeus</i> | | x |
| | Common Pippistrelle (bat) | <i>Pipistrellus pipistrellus</i> | | x |
| | Leisler's (bat) | <i>Nyctalus leisleri</i> | | x |
| | Otter | <i>Lutra lutra</i> | | x |
| | Red Squirrel | <i>Sciurus vulgaris</i> | x | |
| | Badger | <i>Meles meles</i> | | x |
| | Fox | <i>Vulpes vulpes</i> | x | |
| <p>The above listing does not include all species of fauna associated with the Mangala. Additional survey work should be undertaken to further populate the list. * Non-native species</p> | | | | |

Appendix IV

Invasive Species Lists

From NBDC website

| 2km grid square | Group | Common Name | Scientific Name |
|-----------------|---------------------------------|-----------------------------|---------------------------------------|
| W76d | terrestrial mammal | American Mink | (<i>Mustela vison</i>) |
| W66z | terrestrial mammal | European Rabbit | (<i>Oryctolagus cuniculus</i>) |
| W66z | terrestrial mammal | Greater White-toothed Shrew | (<i>Crocidura russula</i>) |
| W76j | bird | Greylag Goose | (<i>Anser anser</i>) |
| W66z | insect - beetle (Coleoptera) | Harlequin Ladybird | (<i>Harmonia axyridis</i>) |
| W66z | flatworm (Turbellaria) | A New Zealand Flatworm | (<i>Arthurdendyus triangulates</i>) |
| W76e | flatworm (Turbellaria) | A New Zealand Flatworm | (<i>Australoplana sanguinea</i>) |
| W66z | flowering plant | Butterfly-bush | (<i>Buddleja davidii</i>) |
| W66z | flowering plant | Cherry Laurel | (<i>Prunus laurocerasus</i>) |
| W76j | flowering plant | Common Cord-grass | (<i>Spartina anglica</i>) |
| W66z | flowering plant | Himalayan Honeysuckle | (<i>Leycesteria formosa</i>) |
| W66z | flowering plant | Japanese Knotweed | (<i>Fallopia japonica</i>) |
| W76j | flowering plant | Sycamore | (<i>Acer pseudoplatanus</i>) |
| W66z | flowering plant | Three-cornered Garlic | (<i>Allium triquetrum</i>) |
| W66z | flowering plant | Traveller's-joy | (<i>Clematis vitalba</i>) |
| W76j | flowering plant | Turkey Oak | (<i>Quercus cerris</i>) |
| W66z | fern | Water Fern | (<i>Azolla filiculoides</i>) |

Recorded during habitat mapping for this biodiversity action plan.

| | |
|----------------------------|---|
| Garden yellow archangel*** | <i>Lamiastrum galeobdolon subsp. argentatum</i> *** |
| Himalayan honeysuckle** | <i>Leycesteria formosa</i> ** |
| Japanese knotweed** | <i>Fallopia japonica</i> ** |
| Three-cornered garlic** | <i>Allium triquetrum</i> ** |
| Winter heliotrope** | <i>Petasites fragrans</i> ** |
| Traveller's Joy** | <i>Clematis vitalba</i> ** |
| Cherry laurel** | <i>Prunus laurocerasus</i> ** |
| Butterfly bush** | <i>Buddleja davidii</i> ** |
| Rhododendron** | <i>Rhododendron ponticum</i> ** |
| Sycamore** | <i>Acer pseudoplatanus</i> ** |

** = invasive species listed in (NBDC, 2013)

*** not listed as invasive on NBDC 2019b but is described on the website as at risk of medium impact. The BSBI maps page (bsbi.org/maps) shows this as quite widespread in South and South East Ireland.