Enviroguide
a DNV company

enviroguide.ie

Wildlife Refuge & Biodiversity Management Plan

PRESENTED TO

Zolbury Ltd.
Large Scale Residential Development (LRD) at lands at Blackglen Road, Sandyford, Dublin 18.

December 2024

Environmental Consultancy Services

DOCUMENT CONTROL SHEET

Client	Zolbury Ltd.
Project Title	Large Scale Residential Development (LRD) at lands at Blackglen Road, Sandyford, Dublin 18.
Document Title	Wildlife Refuge & Biodiversity Management Plan

Revision	Status	Author(s)	Reviewed	Approved	Issue Date
00	Draft for internal Review	Liam Gaffney *Senior Ecologist*	-	-	-
01	Client Issue	Liam Gaffney *Senior Ecologist*	Ben Lansbury *Principal Ecologist*	Ben Lansbury *Principal Ecologist*	16.12.2024
02	Client Issue	Liam Gaffney *Senior Ecologist*	Ben Lansbury *Principal Ecologist*	Ben Lansbury *Principal Ecologist*	18.12.2024
03	Client Issue	Liam Gaffney *Senior Ecologist*	Ben Lansbury *Principal Ecologist*	Ben Lansbury *Principal Ecologist*	19.12.2024

REPORT LIMITATIONS

Synergy Environmental Ltd. t/a Enviroguide Consulting (hereafter referred to as "Enviroguide") has prepared this Report for the sole use of Zolbury Ltd. in accordance with the Agreement under which our services were performed. No other warranty, expressed or implied, is made as to the professional advice included in this Report or any other services provided by Enviroguide.

The information contained in this Report is based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate. Information obtained by Enviroguide has not been independently verified by Enviroguide, unless otherwise stated in the Report.

The methodology adopted and the sources of information used by Enviroguide in providing its services are outlined in this Report.

The work described in this Report is based on the conditions encountered and the information available during the said period of time. The scope of this Report and the services are accordingly factually limited by these circumstances.

All work carried out in preparing this Report has used, and is based upon, Enviroguide's professional knowledge and understanding of the current relevant national legislation. Future changes in applicable legislation may cause the opinion, advice, recommendations or conclusions set out in this Report to become inappropriate or incorrect. However, in giving its opinions, advice, recommendations and conclusions, Enviroguide has considered pending changes to environmental legislation and regulations of which it is currently aware. Following delivery of this Report, Enviroguide will have no obligation to advise the client of any such changes, or of their repercussions.

Enviroguide disclaim any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to Enviroguide's attention after the date of the Report.

Certain statements made in the Report that are not historical facts may constitute estimates, projections or other forward-looking statements and even though they are based on reasonable assumptions as of the date of the Report, such forward-looking statements by their nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. Enviroguide specifically does not guarantee or warrant any estimate or projections contained in this Report.

Unless otherwise stated in this Report, the assessments made assume that the Site and facilities will continue to be used for their current or stated proposed purpose without significant changes.

The content of this Report represents the professional opinion of experienced environmental consultants. Enviroguide does not provide legal advice or an accounting interpretation of liabilities, contingent liabilities or provisions.

If the scope of work includes subsurface investigation such as boreholes, trial pits and laboratory testing of samples collected from the subsurface or other areas of the Site, and environmental or engineering interpretation of such information, attention is drawn to the fact that special risks occur whenever engineering, environmental and related disciplines are applied to identify subsurface conditions. Even a comprehensive sampling and testing programme implemented in accordance with best practice and a professional standard of care may fail to detect certain conditions. Laboratory testing results are not independently verified by Enviroguide and have been assumed to be accurate. The environmental, ecological, geological, geotechnical, geochemical and hydrogeological conditions that Enviroguide interprets to exist between sampling points may differ from those that actually exist. Passage of time, natural occurrences and activities on and/or near the Site may substantially alter encountered conditions.

Copyright © This Report is the copyright of Enviroguide Consulting Ltd. any unauthorised reproduction or usage by any person other than the addressee is strictly prohibited.

TABLE OF CONTENTS

LIST OF TABLES **4**

LIST OF FIGURES **4**

1 INTRODUCTION **1**

1.1 BACKGROUND 1
1.2 QUALITY ASSURANCE AND COMPETENCE 1
1.3 ROLES AND RESPONSIBILITIES 2

2 PROJECT DESCRIPTION **2**

2.1 SITE LOCATION 2
2.2 BRIEF DEVELOPMENT DESCRIPTION 2

3 ECOLOGICAL FEATURES TO BE MANAGED **4**

3.1 SUMMARY OF HABITATS AT THE SITE 4
3.1.1 Summary of KER Habitats *4*
3.2 SUMMARY OF KER SPECIES AT THE SITE 7
3.2.1 Amphibians *7*
3.2.2 Common Lizard *8*
3.2.3 Breeding Bird Assemblage *9*
3.2.4 Small Mammals *9*
3.2.5 Bats *11*
3.3 INVASIVE FLORA SPECIES 12

4 HABITAT CREATION & MANAGEMENT MEASURES **14**

4.1 ECOLOGICAL ASPECTS OF THE LANDSCAPE PLAN 14
4.2 WILDLIFE REFUGE 15
4.2.1 Creation of Wildlife Refuge *15*
4.2.2 Management of Wildlife Refuge *16*
4.3 HIBERNACULA FOR INVERTEBRATES AND FAUNA 19
4.3.1 Management of Hibernacula *20*
4.4 WILDLIFE PONDS 20
4.4.1 Management of Wildlife Ponds *22*
4.5 BIORETENTION AREA 23
4.5.1 Management of Bioretention Areas *24*
4.6 BAT BOX SCHEME 25
4.6.1 Management of Bat Box Scheme *26*
4.7 BUG HOTELS 26
4.7.1 Management of Bug Hotels *27*
4.8 BIRD BOX SCHEME – SWIFT BRICKS 27
4.8.1 Management of Swift Bricks *27*

5 GENERAL HABITAT MANAGEMENT MEASURES **28**

5.1 MEADOW GRASSLAND AREAS (HIGH-SWARD) 28
5.2 HEDGEROWS AND TREELINES 28
5.2.1 Newly Planted Hedgerows *28*
5.2.2 General Hedgerow Management *29*
5.3 GENERAL MANAGEMENT 30

6 FLORA & FAUNA PROTECTION MEASURES 31

6.1 GENERAL VEGETATION REMOVAL 31
6.1.1 Ivy Removal from Trees 32
6.2 AMPHIBIAN PROTECTION 33
6.2.1 General Protection During Grass Cutting 33
6.2.2 Amphibian Ladders 33

7 MONITORING 34

7.1 WILDLIFE REFUGE ESTABLISHMENT MONITORING 34
7.2 AMPHIBIAN MONITORING 34
7.3 BAT MONITORING 34
7.4 INVASIVE SPECIES MONITORING 35

8 ADAPTIVE MANAGEMENT 35

9 SCHEDULE OF OPERATIONAL MANAGEMENT/ MITIGATION AND MONITORING MEASURES 36

10 CONCLUSION 44

11 REFERENCES 45

LIST OF TABLES

Table 1. Seasonal restrictions on vegetation removal. Red boxes indicate periods when clearance/works are not advisable. 31
Table 2. Schedule of Operational Management/Mitigation and Monitoring Measures to be Implemented at the Site 36

LIST OF FIGURES

Figure 1. Proposed Site Layout (Source: OMP drwg 20006A-OMP-01-00-DR-A-1000) 3
Figure 2. Treeline (WL2) along the Site's southern boundary with private residential lands. ... 5
Figure 3. Images of the Stream (FW1) running along part of the south-eastern boundary of the Site. Image A & C show the overgrown nature of the stream as it passes through the Site (flow direction shown by blue arrow). Image B shows the stream entering the private garden to the east of the Site. 6
Figure 4. Area of pooling along the Site's eastern boundary. The pooling oirginates from a private garden adjacent to the Site. 8
Figure 5. A patch of wet grassland (GS4) habitat in the south-west of the Site (Photo taken facing west) 8
Figure 6. Small burrows observed in close proximity along the Site's eastern boundary. 10
Figure 7. Sika stags sparring on Site in November 2023. Distinctive sika tail marking visible in right-hand image. 11
Figure 8. Images of the derelict cottage located along the eastern Site Boundary 12
Figure 9. Landscape Plan (Extracted from GA Drwg: 23170_Blackglen_PA_E_LP) 14
Figure 10. Break in wildlife refuge to support future potential access to the east. 15
Figure 11. Existing habitats within the Proposed Wildlife Refuge Area 17
Figure 12. Enhancement Features proposed within the Wildlife Refuge Area 18
Figure 13. Example design of a wildlife-friendly log pile. Extracted from Gardening for Biodiversity (Juanita Browne, 2020). 20

Figure 14. Example of pond specification and contours that should be proivided to contractor creating pond (Source: Baker *et al*., 2011)..... 21
Figure 15. Image adapted from the Landscape Plan showing the bioretention areas proposed in the wildlife refuge (Source: GA Drwg: 23170_Blackglen_PA_E_LP).... 24
Figure 16. An example of a Rocket Bat Box (image sourced from the EcIA (Enviroguide, 2024)) 26
Figure 17. Example pollinator and wildlife friendly management signage available from Pollinators.ie 30
Figure 18. Image of an amphibian ladder (https://www.thebhs.org/images/stories/BHS_gulleyPotLadder-MKII_flier.jpg) 33

1 INTRODUCTION

1.1 Background

Enviroguide was commissioned by Zolbury Ltd., to prepare a Wildlife Refuge & Biodiversity Management Plan (WRBMP) (hereafter 'the Management Plan' or 'Report') in relation to a Proposed Large-scale Residential Development (LRD), at lands at Blackglen Road, Sandyford, Dublin 18, hereafter referred to as 'Proposed Development' or 'Site', when referring to the application site area.

This Management Plan describes the important ecological features ('Key Ecological Receptors' - KERs) supported by the Site of the Proposed Development, as identified by the surveys carried out to date, and details the specific management approaches to be followed for each feature where applicable. A particular focus is given to the Wildlife Refuge proposed along the Site's southern and eastern boundaries.

These management approaches have been developed by Enviroguide and the relevant specialist ecologists with the understanding that once the measures outlined in this Report are followed, the important ecological features in question e.g., specific habitats and species populations will be supported and maintained on Site into the future.

The management sections in this Report (Section 4 and Section 5) will be referred to by the management company hired to maintain the Site during the Proposed Development's operational lifetime, providing them with the necessary information to carry out the required management to the required standard.

1.2 Quality Assurance and Competence

Enviroguide Consulting is a multi-disciplinary consultancy specialising in the areas of the Environment, Waste Management and Planning. All of our consultants carry scientific or engineering qualifications and have a wealth of experience working within the Environmental Consultancy sectors, having undergone extensive training and continued professional development.

Enviroguide Consulting as a company remains fully briefed in European and Irish environmental policy and legislation. Enviroguide staff members are highly qualified in their field. Professional memberships include the Chartered Institution of Wastes Management (CIWM), the Irish Environmental Law Association and Chartered Institute of Ecology and Environmental Management (CIEEM).

All surveying and reporting have been carried out by qualified and experienced ecologists. Enviroguide senior ecologist, Liam Gaffney coordinated the ecological surveys of the Site and prepared this Report. Subcontracted specialist herpetologist Rob Gandola undertook the amphibian and lizard rapid assessment survey of the Site and provided recommendations for same.

Liam Gaffney has a B.Sc. in Zoology (Hons) and a M.Sc. (Hons) in Wildlife Conservation and Management from University College Dublin. Liam is a Senior Ecologist with 5 years of experience in Ecological Consultancy and is experienced in desktop research, literature scoping-review, and report writing, as well as practical field experience (e.g., Bat surveys,

habitat surveys, invasive species surveys, wintering bird surveys, large mammals, fresh water macro-invertebrates etc.). Liam is experienced in compiling Biodiversity Chapters of EIARs, Ecological Impact Assessments (EcIA), Appropriate Assessment (AA) screening and Natura Impact Statements (NIS) reports, and in the overall assessment of potential impacts to ecological receptors from a range of developments. Liam is also a Qualifying member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

Rob Gandola is a herpetologist expert with a MSc in Ecology from Bangor University, Wales and a BSc (hons) Zoology from UCD. He provides training and professional advice to Local and National Authorities, heritage rangers, eNGOs, and community groups in Ireland and Northern Ireland, and regularly carries out surveys and implements monitoring projects on their behalf.

1.3 Roles and Responsibilities

A **management company** will be assigned, and it will be a condition of their contract to implement this Wildlife Refuge & Biodiversity Management Plan.

In addition, a suitably qualified project **ecologist** will be retained to ensure that the necessary measures are implemented; to oversee habitat creation and enhancement; and to conduct ecological monitoring.

An **amphibian specialist** will be required to undertake monitoring at the Site, and to oversee the creation of amphibian habitats such as the eastern bio-retention basin, wildlife ponds and hibernacula (hibernation features such as log piles).

A schedule of all management and monitoring measures, inclusive of roles and responsibilities, is outlined in Table 5. This plan will be implemented regardless of the occupancy levels in the new development.

2 PROJECT DESCRIPTION

2.1 Site Location

The Site of the Proposed Development is located at Blackglen Road, Sandyford, Dublin 18, 710m south of the M50 and 3km west of Leopardstown Golf Course. The Site is bounded to the north partially by Blackglen Road, with the remainder of the northern boundary, along with the east, south and western boundaries, bounded by residential dwellings and their associated gardens. The Site is also abutted by the Woodside Road to the south-west and the Carrickmines stream along the south-east. The surrounding landscape is comprised of residential estates, agricultural land and areas of woodland.

2.2 Brief Development Description

Zolbury Ltd. intend to apply to Dún Laoghaire Rathdown County Council for permission for development for a Large-Scale Residential Development (LRD) on a site of approx. 3.86ha on lands at Blackglen Road, Sandyford, Dublin 18.



FIGURE 1. PROPOSED SITE LAYOUT (SOURCE: OMP DRWG 20006A-OMP-01-00-DR-A-1000)

3 ECOLOGICAL FEATURES TO BE MANAGED

3.1 Summary of Habitats at the Site

The habitats within the Site of the Proposed Development are coded and categorised to level 3 according to Fossitt (2000).

The Site was surveyed on the 16th September 2021 and 29th November 2023, and presented an uneven, undulating topography, with rocky granite outcrops present towards the centre of the Site at its highest point. The Site slopes down northwards to the Blackglen Road from this high point, sloping down to the east and south-east also. The land cover at the Site comprises of a mosaic of bracken and gorse scrub, broken up by sections of both deer-grazed and more overgrown grassland, and recolonising bare ground. The Site appears to have been cleared partially in the past, as evidenced by the islands of gorse and woody debris, and areas of exposed earth and recolonising vegetation. Treelines and hedgerows made up the majority of the boundaries of the Site, with old stone walls in poor repair also present in places. A section of drainage ditch was identified in the south-west of the Site along the Woodside Road.

The following habitats were identified within the redline boundary of the Site:

- Scrub (WS1)
- Spoil and Bare Ground (ED2)
- Recolonising bare Ground (ED3)
- Exposed Siliceous Rock (ER1)
- Wet Grassland (GS4)
- Bracken (HD1)
- Acid Grassland (GS3)
- Hedgerows (WL1)
- Treelines (WL2)
- Stone Walls and other stonework (BL1)
- Drainage Ditches (FW4)
- Eroding/upland rivers (FW1).

3.1.1 Summary of KER Habitats

3.1.1.1 Hedgerows (WL1) & Treelines (WL2)

Treelines are present along the majority of the eastern and southern boundaries of the Site, associated with private residential dwellings and gardens. A prominent treeline is present along the south-eastern boundary; comprising large conifers such as leyland cypress (*Cupressus × leylandii*) and pines (*Pinus spp*), along with broadleaf species including sycamore (*Acer pseudoplatanus*), lime (*Tilia sp.*) and holly (*Ilex aquifolium*). Non-native invasive cherry laurel (*Prunus laurocerasus*) was also present emerging from the understory of this treeline.



FIGURE 2. TREELINE (WL2) ALONG THE SITE'S SOUTHERN BOUNDARY WITH PRIVATE RESIDENTIAL LANDS.

Along the eastern Site boundary, a treeline comprised of hawthorn (*Crataegus monogyna*), sycamore, and holly is present, with a gapped section made up of gorse hedgerow (*Ulex europaeus*). Hedgerows running along the majority of the eastern and north-eastern boundaries of the Site were ornamental and monotypic in nature comprising of leylandii.

Along the northern Site boundary with Blackglen Road a broken hedgerow comprised of hawthorn, gorse, willow (*Salix sp.)* and bramble (*Rubus fruticosus*) was present during the 2021 visit. This hedgerow has since been removed as part of the road works along Blackglen Road. Non-native species Himalayan honeysuckle (*Leycesteria formosa*) was recorded along this hedgerow, particularly in the north-easternmost corner of the Site.

3.1.1.2 Carrickmines Stream (FW1)

A section of an upland eroding stream – the Carrickmines Stream (1st order) runs along the south-eastern corner of the Site. The stream channel is narrow (<50cm) and overgrown as it passes the Site (Figure 3A & C), with a steeply sloping overgrown bank to the south, and a less steep slope rising from the stream on its Site-side bank. Tall vegetation overshadows the stream with bracken and nettles dominating.

The flora species present along the riparian edges of this narrow stream are terrestrial in nature with no aquatic species recorded. Species included nettle, bracken, creeping buttercup, herb-Robert, spear thistle, ragwort, dock (*Rumex sp.*), lesser knotweed (*Persicaria campanulata*) and hedge bindweed (*Calystegia sepium*).

The stream channel opens up (ca.1m) as it leaves the Site and enters a private garden to the east. The stream bed substrata here is largely comprised of stones, gravels and woody debris, with occasional small boulders (See Figure 3B).



FIGURE 3. IMAGES OF THE STREAM (FW1) RUNNING ALONG PART OF THE SOUTH-EASTERN BOUNDARY OF THE SITE. IMAGE A & C SHOW THE OVERGROWN NATURE OF THE STREAM AS IT PASSES THROUGH THE SITE (FLOW DIRECTION SHOWN BY BLUE ARROW). IMAGE B SHOWS THE STREAM ENTERING THE PRIVATE GARDEN TO THE EAST OF THE SITE.

3.2 Summary of KER Species at the Site

3.2.1 Amphibians

The Site of the Proposed Development likely supports a breeding population of common frog (*Rana temporaria*) with juveniles recorded at the Site during an assessment by a herptile expert in July 2024 (Gandola, 2024). The Site contained two areas of transient pooling during the previous surveys; one in the south-west of the Site (Figure 5) within some wet grassland and one along the Site's eastern boundary (Figure 4) that is associated with an adjoining private garden pond. Both had dried up by the time of the July walk-over carried out by Mr Gandola. The July assessment was undertaken outside of the optimal survey season for amphibians and so the presence of smooth newt (*Lissotriton vulgaris*) on Site could not be determined. Smoot newts are known to inhabit ponds in Fitzsimon's Woods across the road to the north-east of the Site and so may be present on Site.

As no targeted surveys for amphibians were carried out during the optimal survey period, it is assumed that a locally important population of frog and smooth newt may be present in the areas of transient pooling that occur at the Site. The area of pooling along the eastern boundary of the Site, is located within the proposed wildlife corridor/refuge, and so will be retained. The south-western wet grassland area that supported pooling will be lost to facilitate the access road and development footprint.



FIGURE 4. AREA OF POOLING ALONG THE SITE'S EASTERN BOUNDARY. THE POOLING OIRGINATES FROM A PRIVATE GARDEN ADJACENT TO THE SITE.



FIGURE 5. A PATCH OF WET GRASSLAND (GS4) HABITAT IN THE SOUTH-WEST OF THE SITE (PHOTO TAKEN FACING WEST).

3.2.2 Common Lizard

The presence of stone walls, bracken, scrub, and some rocky outcrops, would indicate that the Site is suitable for the common lizard (*Lacerta vivipara*) and this species may be present,

however, no evidence of this species was recorded during the Site surveys. The herptile assessment conducted by Mr Gandola in July 2024 did not record any lizards, however they are known to be present in the mountains to the south and suitable habitat was observed. As no targeted surveys for common lizard were carried out, it is assumed that a locally important population of this species may be present at the Site.

3.2.3 Breeding Bird Assemblage

A total of 20 bird species have been recorded within the 2km grid square O12S in the last 30 years. Of these, two are amber listed birds and one is red listed as identified on the Birds of Conservational Concern in Ireland (BoCCI) (Gilbert et al. 2021) (Please see the EcIA (Enviroguide, 2024) accompanying this application under separate cover for further details).

A total of 25 species were identified within the vicinity of the Site of the Proposed Development during the breeding bird survey in July 2021 and the scoping survey carried out in November 2023. These were either associated with the treelines and hedgerows that run along the Site boundaries or observed foraging across the Site lands.

No species listed on the BoCCI Red List were recorded at the Site of the Proposed Development during the survey. Five species which are on the BoCCI Amber List were recorded during the survey.

- Swallow (*Hirundo rustica*) – up to 10 birds were feeding over area.
- Willow warbler (*Phylloscopus trochilus*) – one heard in song.
- Starling (*Sturnus vulgaris*) – feeding in the area.
- Goldcrest (*Regulus regulus*) – present along hedgerows and mature deciduous woodlands.
- Linnet (*Linaria Cannabina*) – small party feeding in the scrubland areas.

Considering the variety of bird species recorded both in the historical records and during the various field surveys, it is considered that the Site contains resident and regularly occurring, locally important populations of bird species protected under the Wildlife Act 1976 (as amended).

3.2.4 Small Mammals

The habitats available at the Site are not optimal for the majority of the native mammals recorded within the vicinity of the site based on a desk study using local National Biodiversity Data Centre records. However, the Site may support western European hedgehog (*Erinaceus europaeus*), pygmy shrew (*Sorex minutus*) and Irish stoat (*Mustela erminea subsp. hibernica*). These species are less likely to be recorded during walkover surveys due to their timid behaviours and/or nocturnal habits.

Hedgehog and pygmy shrew have potential to utilise the Site lands in their current condition. These small, relatively widespread species inhabit both urban and rural landscapes, and may inhabit the Site and surrounding gardens. No evidence of either species was recorded during the Site surveys. Irish stoats have the potential to utilise wooded habitat in the lands surrounding the Site.

Two small mammal burrows were observed in the east of the Site at the base of a tree by the derelict cottage in November 2023. These burrow entrances were small ca.15cm width, with one part blocked by a buried rock, narrowing the entrance, meaning they were likely dug by a

smaller mammal e.g., rabbit (*Oryctolagus cuniculus*). The burrow entrances contained debris and looks to have been in disuse for some time (Figure 6). A fox scat was recorded along the southern boundary, and scuffle marks indicative of mammal foraging were recorded along the western boundary. No signs of other mammals were observed during the survey.



FIGURE 6. SMALL BURROWS OBSERVED IN CLOSE PROXIMITY ALONG THE SITE'S EASTERN BOUNDARY.

Badger (*Meles meles*) could potentially forage at the Site if in the locality, however, no signs were observed during the survey in November 2023, despite a thorough survey being conducted for setts, latrines, mammal trails and prints. It is therefore unlikely that badger regularly use the Site and the thin soils and exposed bedrock present at the Site would indicate a lack of suitability for badger sett creation. This common countryside mammal is likely to be present in the locality and setts are known to exist in Fitzsimon's Woods across the road to the north of the Site (D'arcy, 2021).

Red squirrel (*Sciurus vulgaris*) are limited to more rural parts of the country with higher tree cover e.g., woodland, commercial forestry plantations etc., (Lawton et al., 2020) and may utilise suitable habitats in the lands surrounding the Site of the Proposed Development. The Site itself provides limited habitat potential in its current state and no evidence of this species was recorded during Site visits.

Several mammal trails were observed entering the Site from the Woodside Road (southern end of the Site) likely deer related. An abundance of deer prints and droppings were recorded throughout the Site, with sika deer (*Cervus nippon*) observed on Site during site visits; a doe and young male recorded separately grazing in the north of the Site on 16th September 2021, and a peak count of five deer recorded in 2023, including both stags and does. A pair of stags were observed sparring in the centre of the Site in 2023 (Figure 7). Sika deer, although invasive are offered a level of protection under the Wildlife Act 1976 as amended.



FIGURE 7. SIKA STAGS SPARRING ON SITE IN NOVEMBER 2023. DISTINCTIVE SIKA TAIL MARKING VISIBLE IN RIGHT-HAND IMAGE.

3.2.5 Bats

The majority of tall vegetation within the Site consisted of scrub and hedgerows along the boundaries. There are large mature trees along the southern boundary, but these are located outside of the Site and within private residential lands. The remaining boundaries were either linear habitat with individual hawthorn trees (e.g., northern boundary along Blackglen Road) or *Leyandii* linear hedgerows (e.g., north-western boundaries with residential lands). No potential bat roosts were noted within the Site, with some boundary treelines and hedgerows showing moderate levels of commuting and foraging activity by potentially six bat species.

No bat roosts were recorded at the Site and limited tree cover exists therein. There was overall moderate bat usage of the Site of the Proposed Development observed during the on-site activity surveys, with most bat activity focused along the vegetative boundaries in the south of the Site. As such it is considered that the Site and the habitats along its southern and eastern boundaries in particular support regularly occurring populations of Irish bat species, commuting and foraging through the Site.

The derelict cottage along the eastern boundary provides low roost potential and is located outside of the Site itself, although adjacent to the eastern Site boundary. This structure was inspected for roosting bats and roost potential on the 5th of May 2022, with static detectors deployed. A low level of bat activity was recorded, and it was concluded due to the open structure of the building, that calls recorded by the static detector were not indicative of roosting bats (echolocation call structure was indicative of commuting and foraging bats). A subsequent inspection carried out on the 29th November 2023 confirmed the results of the 2022 assessment. The structure is missing its roof and eastern side walls and is therefore open to the elements (Figure 8). The walls of the cottage were observed to be largely rendered although some cracks and crevices were noted

Due to its location, the cottage will be buffered from the Site to the west by the designated wildlife corridor/refuge area proposed along the Site's southern and eastern boundaries. This corridor will also follow the commuting and foraging route noted to be important to bats during the bat surveys of the Site. For more detail, please see the EcIA (Enviroguide, 2024).



FIGURE 8. IMAGES OF THE DERELICT COTTAGE LOCATED ALONG THE EASTERN SITE BOUNDARY

3.3 Invasive Flora Species

There are records for 4 species of flora considered to be invasive within the 2km (O12S) grid square within which the Site of the Proposed Development is located:

- Water Fern (*Azolla filiculoides*) (Medium Impact/**Amber listed**[1])
- Butterfly-bush (*Buddleja davidii*) (Medium Impact/ **Amber listed**)
- Himalayan Honeysuckle (*Leycesteria formosa*) (Medium Impact/ **Amber listed**)
- Sycamore (*Acer pseudoplatanus*) (Medium Impact/ **Amber listed**)

As detailed within the Invasive Alien Species Management Plan (IASMP) prepared for the Site (INVAS Biosecurity, 2024), nine invasive alien plant species (IAPS), one that is listed in the

[1] Impact status based on the 2013 Invasive Species in Ireland risk assessment. See report: Kelly, J., O'Flynn, C., and Maguire, C. 2013. Risk analysis and prioritisation for invasive and non-native species in Ireland and Northern Ireland. http://invasivespeciesireland.com/wp-content/uploads/2013/03/Risk-analysis-andprioritization-29032012-FINAL.pdf

First Schedule (Part 1) of SI 374/2024 (highlighted in bold) and eight that are known to be invasive in Irish riparian and terrestrial habitats, were recorded throughout the survey area. These included rhododendron (*Rhododendron ponticum*), butterfly-bush, cherry laurel, cotoneaster (*Cotoneaster horizontalis*), himalayan honeysuckle, lesser knotweed, old man's beard (*Clematis vitalba*), sycamore and winter heliotrope (*Petasites pyrenaicus*).

Of this list, rhododendron is contained in Irish Legislation (S.I 374/2024), with no species from the EU Regulation (EU 1143/2014) detected at this site. Rhododendron seedlings were recorded in the south of the Site, possibly having spread from a private residence to the south.

A single cherry laurel bush was noted as present along the Site's southern treeline boundary. Butterfly-bush was noted to be widely distributed across the scrubby sections of the Site. Winter heliotrope was identified along the south-western boundary of the Site, along the Woodside Road and in the north of the Site. Cotoneaster was noted in the southern scrub section of the Site and in its north-western part. Himalayan honeysuckle was present in the north-eastern corner of the Site. Lesser knotweed was present in one location to the south-east of the Site, across the far side of the stream. Sycamore was present along the various treelines along the Site's margins. One large infestation of old man's beard was present in the north of the site, primarily growing on top of butterfly bush scrub.

It is expected that invasive plant species will be dealt with during the Construction Phase of the Proposed Development, as per the IASMP. However, Operational Phase monitoring is recommended in this Report to ensure no re-colonisation occurs.

4 HABITAT CREATION & MANAGEMENT MEASURES

4.1 Ecological Aspects of the Landscape Plan

The needs of local wildlife have also been incorporated into the proposed design, with various areas of different habitat types proposed; including wildlife ponds along the eastern wildlife refuge for local amphibian populations to adopt, wildflower meadow areas throughout for local pollinator species, and potential mammal habitat in the wooded margins of the Site. Bat boxes have also been provided as habitat enhancement measures to provide additional roosting habitat for the local bat population known to use the Site. The proposed landscaping of the Site will continue to support and contribute to the habitat connectivity between the wilder uplands to the south and the Fitzsimon's Woods to the north, as well as the various gardens, treelines and hedgerows in the surrounding area. The landscape plan for the Site is shown below in Figure 9.



FIGURE 9. LANDSCAPE PLAN (EXTRACTED FROM GA DRWG: 23170_BLACKGLEN_PA_J_LM)

4.2 Wildlife Refuge

Local ecology and wildlife considerations have been integral to the design of the landscape plan for the Site. Following pre-application consultation and a meeting with DLR's Biodiversity Officer, a designated wildlife refuge corridor has been incorporated, beginning in the south of the Site at Woodside Road and running northwards along the south-eastern and eastern Site boundaries. This corridor of ca. 10m in width will be set aside for use by local wildlife e.g., mammals, birds and bats, to exist undisturbed alongside the Site and provide habitat connectivity between lands to the south and north of the Site e.g., Fitzsimon's Woods pNHA.

This area will be separated from the residential component of the LRD by a dense native hedgerow and sturdy wire fencing, to dissuade residents and dogs from accessing the refuge area. Planting within the wildlife corridor will consist of pine and birch trees, along with upland shrub species appropriate for the Site's upland setting e.g., heathers (*Calluna vulgaris* & *Erica cinerea),* common juniper (*Juniperus communis*), purple moor grass (*Molina caerulea*) and hawthorn shrubs.

It is noted that a break will be present in the wildlife refuge where a potential future access route to adjacent lands to the east has been included at the request of DLR's Transport Department. It will be possible for wildlife to move from one side of this access road width to the other without impediment. A combination of a small berm and dense hedgerow will be used to delineate the edges of the refuge on either side of this access road.

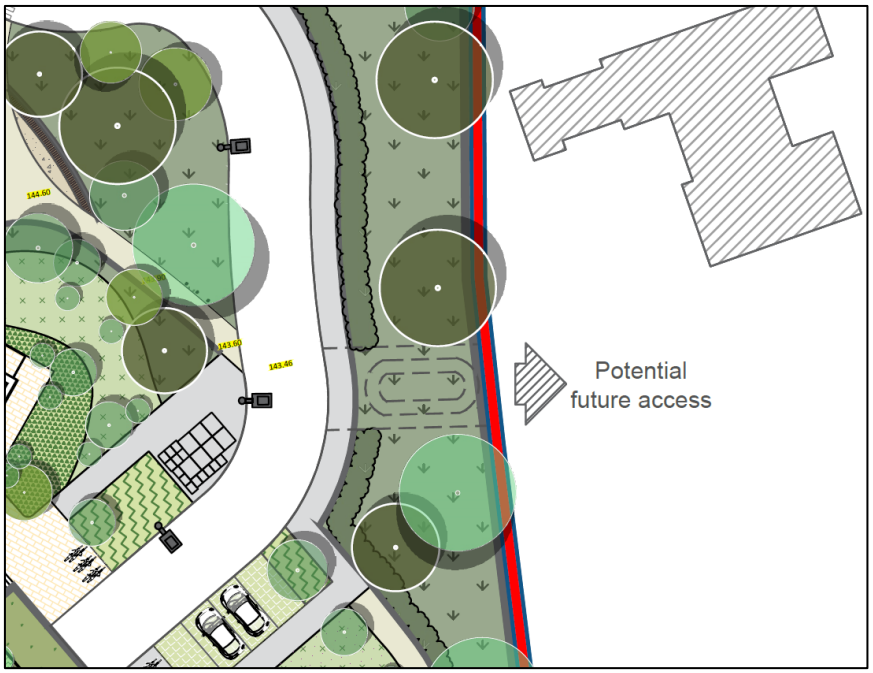


FIGURE 10. BREAK IN WILDLIFE REFUGE TO SUPPORT FUTURE POTENTIAL ACCESS TO THE EAST.

4.2.1 Creation of Wildlife Refuge

The set aside and protection of the area designated for the wildlife refuge will occur at the beginning of the Construction Phase, with the area defined as per the relevant landscape plans and protected by robust fencing e.g., a combination of heras fencing and wooden posts where ground conditions allow. This fencing will include clear signage noting the area as a wildlife refuge to ensure construction staff are aware of its presence and importance. This

fencing will be maintained for the duration of the Construction Phase and checked regularly by the contractor and the Ecological Clerk of Works (ECoW) to ensure it is operational and effective in protecting the wildlife refuge. The Site-side of the wildlife refuge i.e., its internal boundary, will be delineated by a combination of new dense native hedgerow planting, and robust dog-proof wire fencing. A low berm/ditch combination may also be appropriate depending on spatial constraints.

Wherever possible machinery movement and activity within the wildlife refuge area will be avoided and any works required will be carried out from the adjacent main Site area.

Within the wildlife refuge area itself, minimal work is needed to create or 'set-up' the refuge. In its current condition it already contains a variety of habitats, with areas of deer-grazed grassland, bracken, scrub and exposed ground already present. The creation of the wildlife refuge will largely comprise of the fencing off and protection of its extent, along with some native tree and shrub planting, however it must be ensured that the refuge is not overly planted, and that a patchwork of vegetated and open areas is maintained for a variety of wildlife to benefit from. The creation of the wildlife ponds and other features within the wildlife refuge are discussed in the following sections.

4.2.2 Management of Wildlife Refuge

The management goal of the wildlife refuge is to provide an area of natural habitat separated from the main residential development proposed, where fauna such as frogs, lizard, mammals, birds and bats can exist relatively undisturbed by their human neighbours. To support these animal groups the habitats within the refuge will need to be 'heterogenous' (variable) and cannot become completely dominated by one plant species e.g., bracken or gorse.

The management team will ensure that a variety of habitats exist within the refuge area. The current habitat mix is already heterogenous, with areas of deer-grazed grassland, bracken, scrub and exposed ground already present. The management regime will seek to maintain this mix through occasional selective cutting of some areas of dense scrub and bracken, and occasional soil scrapes in select areas to ensure patches of the underlying granite geology are exposed to create lizard sunbathing areas.

This selective vegetation cutting will not include the boundary hedgerows and treelines that run along either side of the refuge area, these will be encouraged to grow dense and tall (as per guidance in Section 5.2.2.1) to provide shelter, and habitat connectivity to local fauna, as well as protection from the adjacent residential component of the Proposed Development.



FIGURE 11. EXISTING HABITATS WITHIN THE PROPOSED WILDLIFE REFUGE AREA

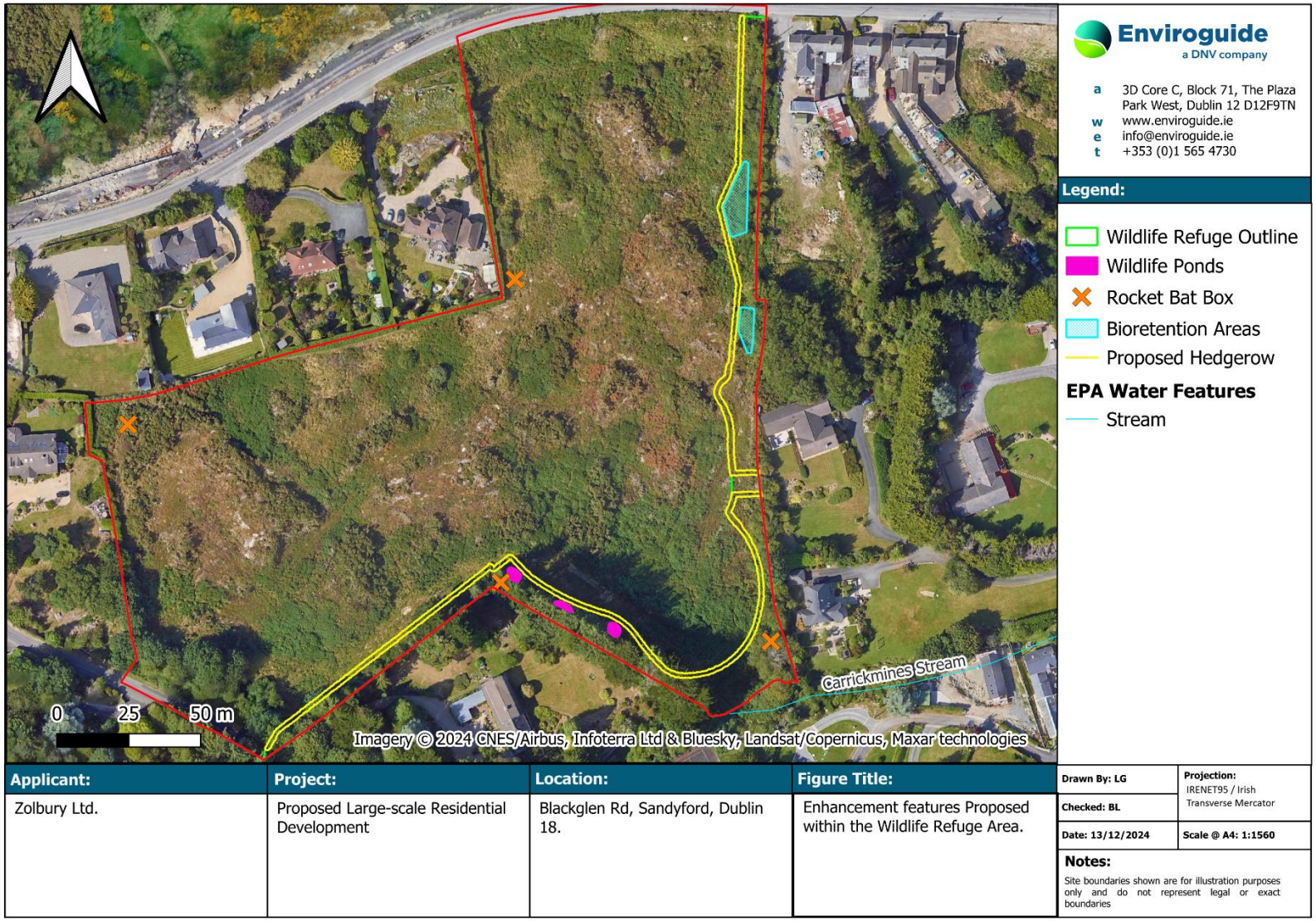


FIGURE 12. ENHANCEMENT FEATURES PROPOSED WITHIN THE WILDLIFE REFUGE AREA

4.3 Hibernacula for Invertebrates and Fauna

Hibernacula or 'refugia' for amphibians and reptiles will be constructed at the Site as part of the biodiversity enhancement approach. These features are relatively easy to create from rubble, logs and soil, all of which can likely be sourced from the Site during works.

Hibernacula will be created at the beginning of the Construction Phase to provide alternative habitat for wildlife during the Construction Phase and mitigate the loss of existing habitats.

The numbers and location of the hibernacula at the Site will be guided by the ECoW / Project Ecologist. Figure 13 below shows how these features can be constructed to maximise their biodiversity value. Small/medium piles of logs and other woody vegetation will be placed in discrete, out-of-the-way parts of the Site; such as along the wooded margins of the Site, particularly within the wildlife corridor proposed along southern and eastern boundaries, where wildlife ponds and a bioretention area are proposed. According to Baker *et al.* (2011), Hibernacula should be located:

- Close to a breeding site i.e., pond (within 250m maximum).
- In an area unlikely to flood.
- Within habitat likely to be used by amphibians.
- In an area with minimal disturbance.

To create hibernacula rubble and wood in various sizes can be piled either in a shallow depression in a disorganised way to create nooks and crevices. Larger logs or rocks can be placed so that they will protrude through the final mound to provide open entrance points for small wildlife. The pile should then be covered in soil to allow the inner crevices to maintain a stable temperature through the winter and allow for hibernation. The top can be planted with for example grass and native wildflowers. These will provide potential habitat for common frog, lizard and small mammals such as hedgehog and pygmy shrew. These piles will also benefit local invertebrate species through the provision of shelter and food sources.

The location, construction and type of refugia (e.g., log pile, rubble pile etc.) will be informed by consultation with an Ecologist. At the very least, small-medium piles of logs and leaf litter; associated with the vegetation clearance and operational maintenance of the woodland areas, should be distributed throughout the wooded margins of the Site to provide habitat for amphibians, insects and small mammals. These habitats will be particularly important for amphibians given they likely breed at the Site. These areas of woody debris will also benefit local invertebrate species through the provision of shelter and food sources.

Hibernacula will be left by management and remain undisturbed in discrete locations to allow colonisation by invertebrates and fungi as part of the biodiversity provision at the Site. These features will require minimal maintenance, with new logs and vegetation added as the older logs break down. Decaying wood can support a range of fungi and microhabitats and will be maintained as part of the log-pile habitat.

No herbicides, fertilisers or pesticides will be used near to hibernacula to protect the wildlife they provide habitat for.

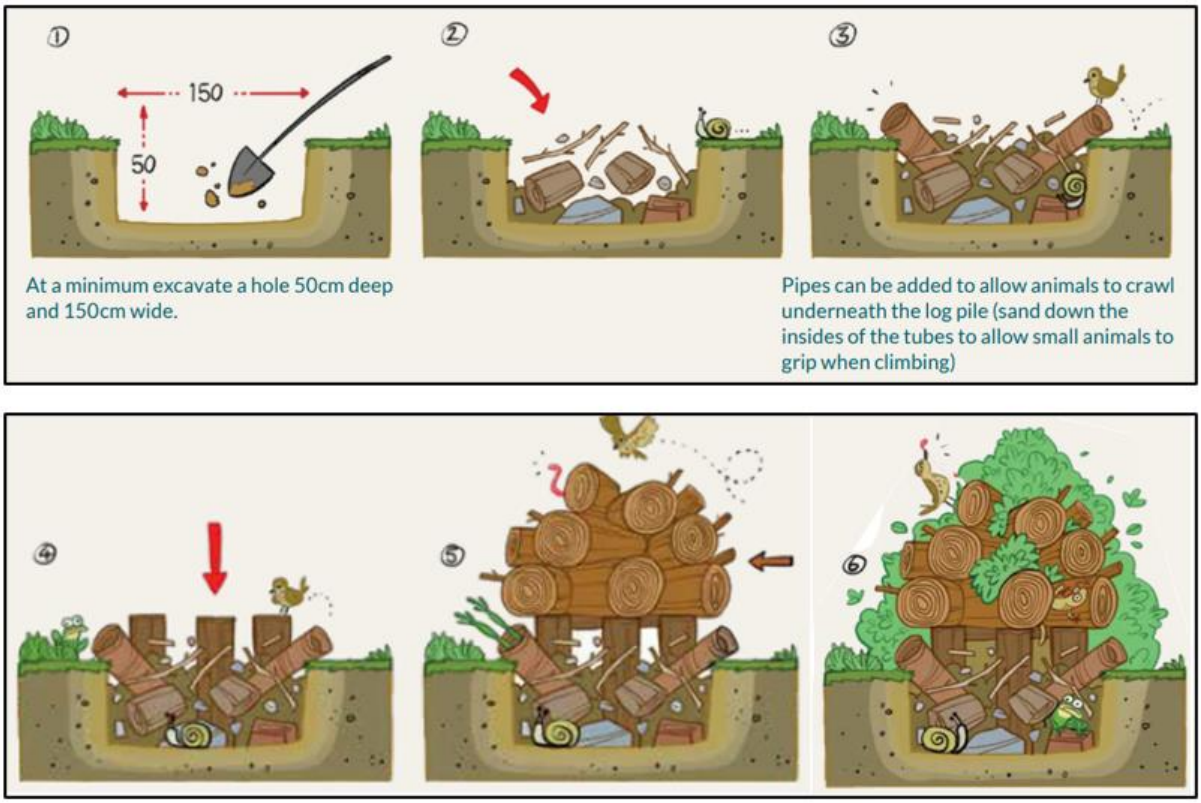


FIGURE 13. EXAMPLE DESIGN OF A WILDLIFE-FRIENDLY LOG PILE. EXTRACTED FROM GARDENING FOR BIODIVERSITY (JUANITA BROWNE, 2020).

4.3.1 Management of Hibernacula

Hibernacula such as log piles will be left by management and remain undisturbed in discrete locations to allow colonisation by invertebrates and fungi as part of the biodiversity provision at the Site.

Log-piles require minimal maintenance, with new logs and vegetation added as the older logs break down. Decaying wood can support a range of fungi and microhabitats and will be maintained as part of the log-pile habitat.

No herbicides, fertilisers or pesticides will be used near to log-piles to protect the wildlife they provide habitat for.

4.4 Wildlife Ponds

Several natural shallow wildlife ponds are proposed to be located along part of the Site's southern boundary (See Landscape Plan prepared by Gannon & Associates), within the wildlife corridor/refuge. The ponds will be constructed as per Baker *et al*. (2011) the *Amphibian Habitat Management Handbook. Amphibian and Reptile Conservation with best practice ecological guidance.* Section 4: Pond Creation, on page 19 of this document provides detail on best-practise when creating amphibian pond habitat, some of which is summarised below.

The construction of these ponds will take cognisance of this guide and will be supervised by a suitably qualified ECoW. The contractor should be provided with a specification for the proposed work and a simple diagram showing the contours of each proposed pond as shown in Figure 14.

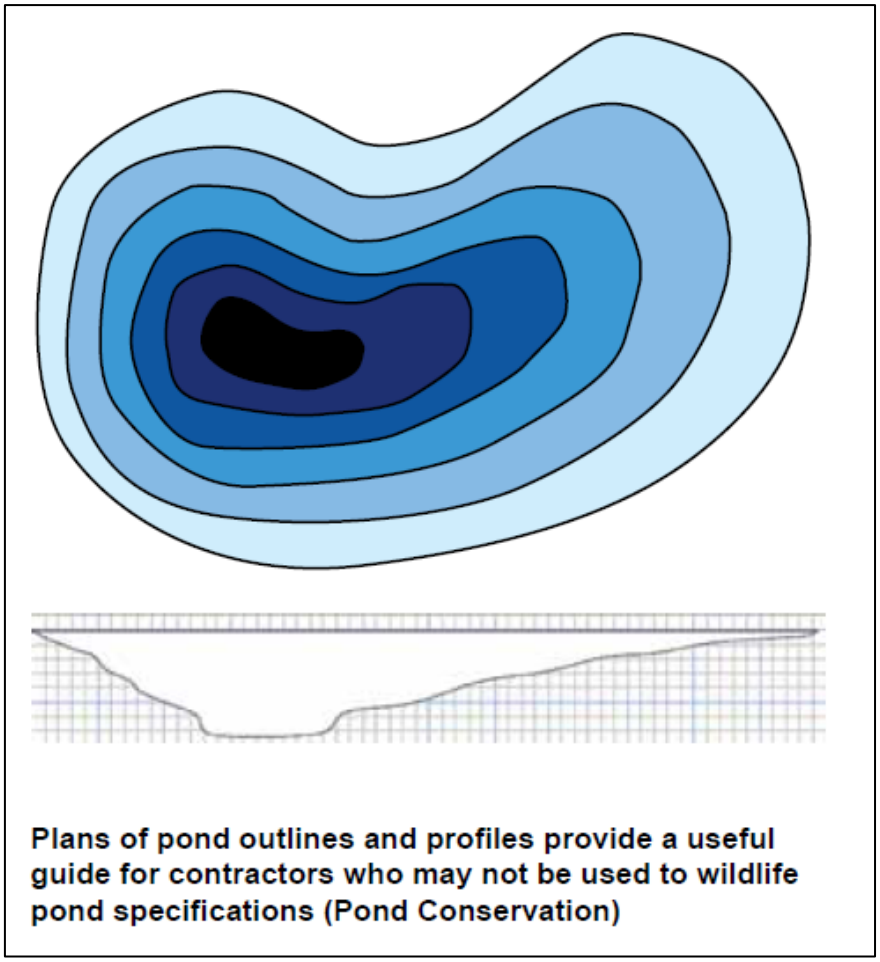


FIGURE 14. EXAMPLE OF POND SPECIFICATION AND CONTOURS THAT SHOULD BE PROIVIDED TO CONTRACTOR CREATING POND (SOURCE: BAKER *ET AL.*, 2011)

As per Baker *et al*. (2011) amphibian ponds should ideally contain a range of microhabitats. To create microhabitat diversity within a pond, the design should incorporate:

- Gently sloping sides.
- A range of pond depths.
- An irregular shape.

Gently sloping pond edges (gradient of 1 in 10 or if possible 1 in 20) create a wide drawdown zone which encourages a diversity of plants and invertebrates.

Shallow areas, less than 10 cm and certainly less than 30 cm deep, support the greatest range of pond plants which in turn create the habitat for most of the pond's invertebrates. Beds of submerged aquatic vegetation provide egg-laying substrates for newts, microhabitat for prey species and refuge from predators. For amphibian ponds it is not necessary for the greatest water depth to exceed 1.2 m.

Soil excavated during pond construction can be used to create a partial bund/berm or raised pond edge to protect the pond from run-off and provide habitat diversity along the pond edge. This bund should not be located right up against the pond edge as it will likely cause sediment run-off into the water and/or collapse in during heavy rainfall.

Topsoil removed from a Site during pond creation (or from any other source) should not be added to the pond after construction e.g., to line it, as topsoil is effectively a nutrient-rich pollutant in the context of pond and waterbodies. If creating a lined pond, sand or sub-soil should be used instead to cover the liner.

Log piles and rocks can be placed along the edge of the pond to provide habitat for amphibians, their insect food species and other wildlife.

4.4.1 Management of Wildlife Ponds

The wildlife ponds will be managed in a way that maximises their ecological value as detailed in the following sections.

As outlined in *The Irish Pond manual: A guide to the creation and management of ponds* (O'Rourke *et al*., 2024), the key to designing wildlife-rich ponds and wetlands is to incorporate areas of marsh and very shallow water where diverse communities can survive even with contaminated water.

This can be achieved by created a wide drawdown zone with ridges and dips along the banks of the proposed feature ponds and attenuation areas, with shallow water (1-2cm deep) creating important wetland habitat for wildlife. Vegetated pond edges with underwater complexes of wetland herbs and grasses are usually the most diverse areas in any pond, with creeping bent, aquatic sweet grasses, mosses creating carpeting habitat preferred by amphibians and invertebrates.

While open water can be aesthetically attractive, it can be the most species poor habitat as it leaves wildlife vulnerable to predation. As such, the more plant cover, the better, with species such as smooth newt preferring up to 75% vegetation cover.

The ponds proposed at the Site will be managed as detailed in the following sections.

4.4.1.1 Minor Works - 1-3 year rotation (August-October)

During the critical early colonising stages of vegetation on Site, and for the first 2-5 years after creation, when the vegetation is still establishing, the pond area will be managed via the below methods:

- Mechanical removal of rapidly colonising aquatic species, such as bulrush, to ensure these do not dominate the new site.
- Ensure the removal of roots of these plants to reduce the likelihood of regrowth.
- As the proposed ponds are located along wooded areas, the removal of some dead leaves/logs/branches may be required to avoid excess nutrients which encourage algal growth, however some dead logs will be retained along the banks of the pond area to provide habitat for species such as dragonflies, which lay their eggs on dead wood close to ponds.

These minor works will be carried out on a 1-3 year rotation and will be undertaken in August – October to avoid disturbance during amphibian breeding season (February – July, inclusive) and hibernation (November – January, inclusive).

4.4.1.2 Medium Scale Works - 3-5 year rotation (September-October)

For medium scale works, including the coppicing and removal of encroaching trees and shade (if required), these works will be undertaken on a 3-5 year rotation outside of the bird nesting season (March 1*st* – August 1*st*, inclusive). Again, September-October is the best time for these works.

While most amphibian species, including frog and smooth newt, prefer areas of shade, clearance of encroaching trees may be necessary to allow plants to grow and provide areas of warmer water, which will encourage frogs and smooth newts to spawn. In additional, the removal of overhanging shade may be beneficial as it allows marginal plants to grow, providing additional foraging resources and habitats for aquatic and marginal insects. The removal and coppicing of trees surrounding the ponds will be undertaken to the extent that a minimum of 25% of the pond habitat is unshaded.

4.4.1.3 Long-term Works - 5-10 year rotation (August-October)

While pond succession is a natural process as ponds mature and infill with sediment, the restoration of pond habitats via desilting is often carried out via dredging in order to reinstate original water levels. As dredging can cause a high level of disturbance to the habitats and species utilising this wetland habitat, these works will be carried out on a 5-10 year rotation and will take place in August – October to avoid disturbance during amphibian breeding season (February – July, inclusive) and hibernation (November – January, inclusive).

4.5 Bioretention Area

Bioretention areas are proposed as part of the Site's SUDS approach. Two bioretention areas are proposed to be located along the eastern boundary, within the wildlife refuge area (Figure 15). These two bioretention areas will function to detain and treat runoff for their respective area, and as such are part of the SUDS approach for the site. However, they are not part of, or linked to, the primary drainage system, and will facilitate surface water to infiltrate to ground.

These two bioretention areas will be planted with native wetland species and will likely become colonised naturally through local seed sources over time. These wetland features will complement the new wildlife ponds proposed within the wildlife refuge area and provide a diversity of wetland habitats for amphibians and invertebrate species.



FIGURE 15. IMAGE ADAPTED FROM THE LANDSCAPE PLAN SHOWING THE BIORETENTION AREAS PROPOSED IN THE WILDLIFE REFUGE (SOURCE: GA DRWG: 23170_BLACKGLEN_PA_J_LM).

4.5.1 Management of Bioretention Areas

The bioretention areas located within the wildlife refuge will be managed on a reduced mowing regime to promote their value for pollinators, amphibians, and ensure natural seeding is maximised each year. See Figure 15 for an image showing the areas in question located along the Site's eastern boundary in the Landscape Plan.

The following management of bioretention areas will be undertaken during the Operational Phase of the Proposed Development:

- A reduced pollinator/ amphibian friendly mowing regime will be implemented:
    - An annual cutting regime for bioretention areas with the cuttings removed to maintain a nutrient poor soil that favours the growth of wildflowers.

- Cutting vegetation in these bioretention areas will take place during late winter when amphibians are inactive. Ideally the cut will be high (minimum 15 cm) to ensure any frogs or newts present are not harmed.
- An added benefit of a late cut is that the wetland vegetation will be allowed to mature and seed heads to form before cutting.
- If vegetation has to be cut when amphibians are active i.e., in spring/summer, then a high cut (minimum 15 cm) is unlikely to harm amphibians.

- Signage will be erected to support the management company to maintain the pollinator and amphibian friendly management regime of bioretention areas.
- Mowing/ strimming will ideally be undertaken during dry conditions to avoid compacting and potentially damaging the soil structure.
- No herbicides[2] or fertilisers will be used within the bioretention areas or the wildlife refuge.

4.6 Bat Box Scheme

A set of 4no. 'Rocket Box' Bat boxes will be erected around the Site to provide new roosting habitat for local bat species. A qualified bat ecologist will be consulted with regards the appropriate type and placement/location of these Rocket boxes. The rocket bat boxes are to be installed under the supervision and guidance of the bat ecologist and will be erected on a 5m pole fixed in $1m^3$ of 40 newton strength concrete. An example of a rocket bat box is shown in Figure 16. An Irish supplier of rocket bat boxes is Éire Ecology (https://eireecology.ie/product/crevice-chambered-rocket-bat-box/).

This provision of roosting habitat at the Site will complement the increased foraging opportunities that will be provided at the Site, in the form of the proposed landscape planting included in the project design.

[2] Ideally, herbicide use within the Site should be avoided entirely, and alternative weed control options (e.g. thermal control with hot water or foam) should be explored as per Pesticide Action Network UK: https://pollinators.ie/wp-content/uploads/2021/05/Alternatives-to-herbicides-a-guide-for-the-amenity-sector.pdf



FIGURE 16. AN EXAMPLE OF A ROCKET BAT BOX (IMAGE SOURCED FROM THE ECIA (ENVIROGUIDE, 2024))

4.6.1 Management of Bat Box Scheme

This type of bat box scheme is 'self-cleaning' due to its open bottomed design, meaning that bat droppings will not accumulate and will simply fall out over time. Bat droppings are comprised of insect remains and are fragile and dusty in appearance, breaking down very quickly in exposed natural settings. With the bat boxes being located along the wooded margins of the Site e.g., in the wildlife refuge area, bat droppings will therefore not be an issue.

No management of the bat boxes is required by the management team. If boxes are observed to be damaged, the management team should not try and fix them immediately as bats may still be roosting inside. Disturbance of bat roosts such as these bat boxes is an offence against the Wildlife Act 1976 (as amended) and requires a licence from the NPWS. This should only be carried out by a licensed bat ecologist.

If a bat box appears damaged, the management team should contact the local NPWS ranger (https://www.npws.ie/contact-us/north-eastern-division) or the project Ecologist on how best to proceed.

4.7 Bug Hotels

At least 5 no. 'Bug hotels' will be installed at various suitable locations across the Site. These structures will be placed as per the instruction of the ECoW, within areas of wildflower or woodland planting.

4.7.1 Management of Bug Hotels

Bug hotels require minimal maintenance. The management company should check for damage annually and repair/replace with a similar sized bug hotel as required.

4.8 Bird Box Scheme – Swift Bricks

A set of 20 No. swift bricks have been included within the design of the proposed apartment buildings.

4.8.1 Management of Swift Bricks

Swift bricks are a low-maintenance enhancement feature as Swifts are a self-cleaning bird species that remove their own waste from their nests (in this case, the swift bricks). No further maintenance of the bricks themselves beyond initial installation by the contractor is required by the management company.

If a 'Swift Calling System' is being installed on the apartment blocks to encourage swifts to take up the bricks, this equipment should be checked regularly during the breeding season March-August to ensure it is working correctly. If any advice is needed regarding a swift calling system, Swift Conservation Ireland can be contacted at: swiftconservationireland@gmail.com. Further information can be found at the following url prepared by Swift Conservation Ireland: https://www.swiftconservation.ie/wp-content/uploads/2024/09/Which-box-September-2024-compressed.pdf.

5 GENERAL HABITAT MANAGEMENT MEASURES

5.1 Meadow Grassland Areas (High-sward)

For areas within the wider Site area proposed as meadow grassland within the landscape plan e.g., the meadow areas around apartment blocks in the north, centre and south-east of the Site, a reduced mowing regime will be followed to allow the tall wildflower and grasses to flower. Management will be as follows:

- A reduced pollinator friendly mowing regime will be implemented:
    - An annual mowing regime for meadow grassland areas with the hay/cuttings removed to maintain a nutrient poor soil that favours the growth of wildflowers. The meadow will be allowed to mature and seed heads to form before cutting – this may be in mid- to late- July or into August[3].
    - A second cut may be required in autumn to reduce the growth of the grassland sward.
- Signage will be erected to support the management company to maintain the pollinator and wildlife friendly management regime.
- Mowing will ideally be undertaken during dry conditions to avoid compacting and potentially damaging the soil structure.
- No herbicides[4] or fertilisers will be used within these meadow grassland habitat areas as this would negatively impact their biodiversity value.

5.2 Hedgerows and Treelines

5.2.1 Newly Planted Hedgerows

For the first year, weeding will be carried out around the base of any newly planted hedgerow in summer. This will prevent competition from grasses and other plants. However, a mulch of chopped bark placed along the length of the hedgerow will prevent weeds from growing up in the first place and help to reduce moisture loss. Trees and shrubs that have died will be replaced in the autumn or winter.

When planting up gaps in an existing hedgerow, great care must be taken to ensure the new plants are not shaded out by existing plants. Hard pruning or even coppicing adjacent shrubs may be required. To this end, control of competitive vegetation for the first few years will be undertaken. In the first spring, the shrubs will be cut down to 45—60cm above the ground. This hard pruning encourages the shrubs to bush out and will help to create a thick hedge.

[3] https://www.farmingfornature.ie/wp-content/uploads/2020/11/Managing-species-rich-grasslands.pdf

[4] Ideally, herbicide use within the Site should be avoided entirely, and alternative weed control options (e.g. thermal control with hot water or foam) should be explored as per Pesticide Action Network UK: https://pollinators.ie/wp-content/uploads/2021/05/Alternatives-to-herbicides-a-guide-for-the-amenity-sector.pdf

5.2.2 General Hedgerow Management

5.2.2.1 Low Intervention Hedgerow Management

The condition of existing hedgerows at the Site will be improved through active low-intervention management and maintenance.

5.2.2.1.1 Hedgerow Cutting

All hedge cutting will be carried out outside the main breeding bird season, i.e. 1st March to 31st August, in compliance with the Wildlife Act 1976 (as amended).

The following, extracted from "Farmland Actions to Help Pollinators"[5] will be implemented along the hedgerows being retained at the Site:

- Hedgerows will be cut on a minimum 3-year cycle, on rotation e.g., a third of the hedgerows left uncut each year. Cutting all hedgerows annually stops the hedgerow flowering and fruiting.
- Bramble and Ivy will be retained in hedgerows, as they are key nectar and pollen sources in summer and autumn.
- The hedgerows will be retained as high as possible, but at least 2.5m above ground level or above the bank.
- The hedgerows will be trimmed in an A-shape, but where feasible they will be side trimmed only.
- Tall grassy meadow margins will be maintained along the bases of each hedgerow as detailed in the following section.

5.2.2.1.2 Hedgerow Margins

The following will be implemented along the bases of the hedgerows at the Site:

- A margin (minimum 1.5 m) will be retained adjacent to existing hedgerows as an ameliorating buffer between the hedgerow flora and the adjacent land use. A margin of at least 2m is recommended (3m in the case of the eastern boundary hedgerow) to be retained adjacent to hedgerows,
- It is recommended that the hedgerow margin is managed in two halves, with the half closest to the hedgerow cut only once every few years, and the other half cut annually after mid-July.
- Herbicides will not be used on hedgerow margins, **except in exceptional circumstances** where spot control of weeds or invasive flora is required.
- Fertilisers will not be spread on the margins of hedgerows as these can reduce wildflowers and increase weeds and grasses.

[5] Farmland: actions to help pollinators. All-Ireland Pollinator Plan, Guidelines 5. National Biodiversity Data Centre Series No.14, Waterford. September 2017

- Physical removal of weeds from hedgerow margins will be undertaken. Herbicides will only be used as a last resort. If herbicide use is required, herbicides will only be used to spot control weeds (e.g. invasive or non-native plants).

5.2.2.1.3 Invasive Flora Removal

Non-native and invasive flora will be removed from the hedgerows within the Site boundary, as per the IASMP (INVAS Biosecurity, 2024). Ongoing monitoring and removal (if required) will also be carried out as per the IASMP.

5.3 General Management

The following best practice maintenance measures will be followed as part of the regular management of the habitats on Site:

- Signage and waste bins will be provided at the Site to minimise dog fouling, which can have a negative effect on biodiversity planting by adding excessive amounts of nutrients and 'over-fertilising' areas and reducing the number and types of wildflowers that will grow.
- Periodic inspection for and if necessary, clean-up of litter.
- Physical removal of undesirable non-native or invasive shrub or herb species should these be recorded within the Site during the Operational Phase. Chemical control will be used only **as a last resort**.
- Signage will be erected to help management follow the pollinator and wildlife-friendly management regime, while also informing residents and visitors of these biodiversity enhancement measures (See Figure 17).



FIGURE 17. EXAMPLE POLLINATOR AND WILDLIFE FRIENDLY MANAGEMENT SIGNAGE AVAILABLE FROM POLLINATORS.IE

6 FLORA & FAUNA PROTECTION MEASURES

6.1 General Vegetation Removal

Removal or trimming of any vegetation on Site will be conducted outside of the breeding bird season, which runs from 1st March to 31st August, inclusive.

Alternatively, in the rare circumstances that vegetation removal is unavoidable between March and August, the area in question will be checked by a suitably qualified ecologist for breeding birds, prior to removal. If breeding birds are present, work shall cease in the vicinity of the area, as determined by the ecologist. The ecologist will return to confirm if nests are no longer active after which clearance works may proceed.

Vegetation trimming of the trees, hedgerows, scrub and any grassland habitat will need to be take consideration of any wildlife potentially present that could be harmed. Table 1 provides guidance for when vegetation clearance is allowed in relation to wintering, hibernating and breeding animals. The preferred period for vegetation clearance is within the months of September and October to avoid the main breeding bird and bat maternity and roosting season as well as mammal, amphibian, and reptile hibernation periods.

TABLE 1. SEASONAL RESTRICTIONS ON VEGETATION REMOVAL. RED BOXES INDICATE PERIODS WHEN CLEARANCE/WORKS ARE NOT ADVISABLE.

Ecological Feature	January	February	March	April	May	June	July	August	September	October	November	December
Breeding Birds	Vegetation clearance permissible **(Sept - Feb)**		Nesting bird season. No clearance of vegetation unless confirmed to be devoid of nesting birds by an ecologist. **(Mar - Aug)**						Vegetation clearance permissible **(Sept - Feb)**			
Bats	Tree felling to be avoided unless confirmed to be devoid of bats by an ecologist. **(Jan - Aug)**								Preferred period for tree-felling **(Sep - Oct)**		Tree felling to be avoided unless confirmed to be devoid of bats by an ecologist **(Nov - Dec)**	
Hibernating mammals (e.g., Hedgehog, Pygmy Shrew)	Mammal hibernation season. No clearance of vegetation unless confirmed to be devoid of hibernating mammals by an ecologist. **(Jan - Mar)**			Vegetation clearance permissible **(Apr - Oct)**							Mammal hibernation season. No clearance of vegetation unless confirmed to be devoid of hibernating mammals by an ecologist. **(Nov - Dec)**	

<table>
<tr><th>Ecological Feature</th><th>January</th><th>February</th><th>March</th><th>April</th><th>May</th><th>June</th><th>July</th><th>August</th><th>September</th><th>October</th><th>November</th><th>December</th></tr>
<tr><td>Amphibians</td><td colspan="2">Habitat clearance permissible (Jan - Feb)</td><td colspan="3">Amphibian breeding season (estimated). No habitat destruction (Ponds, drainage ditches) unless confirmed to be devoid of tadpoles and other signs of amphibians. (Mar - June)</td><td colspan="6">Habitat clearance permissible if devoid of tadpoles and signs of amphibians (July - Dec)</td></tr>
<tr><td>Common Lizard</td><td colspan="2">Lizard Hibernation Season No habitat clearance permissible (November – March)</td><td colspan="7">Active period
Habitat (Scrub, old stone walls) clearance permissible (Early March - October)</td><td>Lizard Hibernation Season No habitat clearance permissible (November – March)</td></tr>
</table>

Additionally, all vegetation clearance / trimming will be carried out in sections working in a consistent direction to prevent entrapment of animals potentially present. A phased cutting approach will be used to allow wildlife (namely, reptiles, amphibians and small mammals) to move away from any suitable habitat that will be removed:

- Phase 1 – Cutting vegetation to 15cm-20cm and removing the cuttings;
- Phase 2 – After a minimum of one hour, hand-searching the cut areas (conducted by an Ecologist) and removing any sheltering habitat (e.g., logs or debris) then cutting vegetation to ground level and removing the cuttings.

Should any suitable log-pile or scrub habitats need to be removed, this will be carried out outside the most vulnerable breeding periods for hedgehogs wherever practicable (main hedgehog birthing months June and July) and will be supervised by an Ecologist.

6.1.1 Ivy Removal from Trees

The following comment was received from DLR as part of the LRD Opinion dated July 2024:

"Cutting of ivy from existing trees should not be the default approach by the Arborist or for tree management without good reason and it would be requested that if any ivy cutting is planned that it is done in consultation with DLR Biodiversity Officer and Parks."

In response to the above request, routine ivy cutting will not be the default management approach for existing trees at the Site and will be carried out with the agreement of DLR Biodiversity Officer and Parks. There are limited trees within the Site of the Proposed Development with minor removals required as part of the proposed works. Trees at the Site provided no bat roost potential during the surveys and are largely to be retained along all of

the boundaries of the Site. The EcIA includes a pre-felling assessment for bat roost potential for all trees to be felled at the Site as part of the Proposed Development.

6.2 Amphibian Protection

6.2.1 General Protection During Grass Cutting

Frogs forage for insect food species within tall grassland areas and are known to be present at the Site. They are therefore at risk of harm during the mowing of meadow grassland areas or areas of semi-natural vegetation. The following approach will help avoid any harm to frogs at the Site:

- Meadow grassland habitats managed for biodiversity will be mown/strimmed carefully and with consideration of small animals that could be present in the long grass. This will allow any wildlife within grassland areas a chance to escape. A high cut will be used (minimum 15cm) as detailed in the preceding sections.
- Any frogs found during maintenance or grass cutting will be carefully picked up and moved to the nearest safe area i.e., a boundary hedgerow, woodland or the wildlife refuge along the eastern boundary.
- All hedge cutting will be carried out outside the main breeding bird season, i.e. 1st March to 31st August, in compliance with the Wildlife Act 1976 (as amended).

6.2.2 Amphibian Ladders

It is recommended that “amphibian ladders” are installed where gully pot drains are to be installed. These additional features will provide wildlife such as the common frog an opportunity to avoid or escape falling into the gully system. Amphibian ladders are custom made for each gully pot and therefore are one of the final additions to the drainage system (See Figure 18).



FIGURE 18. IMAGE OF AN AMPHIBIAN LADDER (HTTPS://WWW.THEBHS.ORG/IMAGES/STORIES/BHS_GULLEYPOTLADDER-MKII_FLIER.JPG)

7 MONITORING

An ecologist will be appointed by the Management Company to carry out the required monitoring regime for the Site as detailed in the following sections. The details of the ecological monitoring and the ongoing habitat management will be provided to DLR Biodiversity Officer by the ecologist. One annual visit by an ecologist should cover the majority of annual assessments, with 5-10 years being the recommended monitoring period.

7.1 Wildlife Refuge Establishment Monitoring

The eastern wildlife refuge area will be monitored once annually during the spring/summer by a suitably qualified ecologist.

The ecologist will observe and make note of the condition of the wildlife refuge in terms of:

- Degree of vegetation cover: No gorse or bracken domination. Presence of a mix of habitat layering through varied vegetation heights.
- Quality of the new and existing hedgerow habitats that run along either side of the refuge: Hedgerows should be semi-natural in appearance with a wide base and meadow margin.
- Common lizard habitat: Presence of exposed rocky out-crop areas for common lizard.
- Amphibian habitat: The wildlife ponds should not be overgrown and overshaded. The eastern bioretention areas should not be densely overgrown and should support wet grassland habitat.
- Invasive plant species: No establishment of IASP should be present. The ecologist will refer to the IASMP and contact the IAS Specialist (in this case INVAS Biosecurity) as required, should an IASP issue be observed.

7.2 Amphibian Monitoring

An amphibian monitoring programme for a minimum of two breeding seasons post construction works will be implemented at the Site by a suitably qualified ecologist. This will include a survey of the retained and proposed pond areas for signs of spawning, and any recommendations required to improve same if required. The results of this monitoring will be provided to DLR CoCo Biodiversity Department for their records.

7.3 Bat Monitoring

Monitoring by a suitably qualified ecologist will be carried out post-construction works. This monitoring will involve the following:

- Inspection of bat boxes within one year of erection of bat box scheme/rocket box. Register bat box scheme with Bat Conservation Ireland. This should be undertaken for a minimum of 2 years.
- Monitoring of bat-friendly lighting post construction. This will be checked to determine it is operating effectively.

- Specific monitoring in relation to the proposed lighting scheme will be undertaken to determine that a level of <1 Lux is achieved along the wooded boundaries of the Proposed Development Site.

7.4 Invasive species Monitoring

Invasive Species of plant at the Site will be managed/treated as per the IASMP prepared for the Site (INVAS Biosecurity, 2024). Although it is expected that invasive plant species will be dealt with during the Construction Phase of the Proposed Development, Operational Phase monitoring is recommended in this Report to ensure no re-colonisation occurs

In many cases, it is not possible to control an established stand of IAS with a single treatment. Therefore, repeated treatments over successive years is necessary. Where physical methods are used to control IAS, the treated area will also need to be monitored over a number of years for regrowth.

Monitoring of all IAS stands treated at the Site will be carried out for 2 years following treatment by a suitably qualified IAS specialist. Further monitoring may be required if treatment has not been successful. A Site may be considered remediated after two consecutive growing seasons with no sign of regrowth from all of the previously identified stands (TII, 2020b).

8 ADAPTIVE MANAGEMENT

As outlined above, the management and mitigation measures will be subject to monitoring where required. The above listed management/maintenance measures are outline in nature, and as a result this document will be updated to reflect any improvements/changes, if recommended by the ecologist following monitoring. Any improvements/changes of measures in the future, where necessary/appropriate, will be provided for agreement with DLR's Biodiversity Officer.

9 SCHEDULE OF OPERATIONAL MANAGEMENT/ MITIGATION AND MONITORING MEASURES

The table below outlines the various biodiversity management tasks to be undertaken at the Site for the duration of its operational lifetime. It also details the monitoring approaches required to ensure these management tasks are successful where applicable. For each task and monitoring programme, the entity responsible has been included in the table for clarity.

TABLE 2. SCHEDULE OF OPERATIONAL MANAGEMENT/MITIGATION AND MONITORING MEASURES TO BE IMPLEMENTED AT THE SITE

Habitat/ Species/ Feature	Operational Phase Management/Enhancement/Mitigation			Operational Phase Monitoring		
	Task	**Frequency**	**Responsibility**	**Task**	**Frequency**	**Responsibility**
Wildlife Refuge	Maintain patchwork habitat mix through occasional selective cutting of some areas of dense scrub and bracken – Patchwork habitat.	Annually	Management Company	The management of the wildlife refuge at the Site will be assessed once annually during the growing season by an Ecologist, for a period of 5-10 years.	Annually for 5-10 years	Ecologist
	Occasional soil scrapes in select areas to ensure patches of the underlying granite geology are exposed to create lizard sunbathing areas.	Annually	Management Company			
	Ensure no one species e.g., gorse or bracken become dominant through selective cutting.	As required	Management Company			

Habitat/ Species/ Feature	Operational Phase Management/Enhancement/Mitigation			Operational Phase Monitoring		
	Task	**Frequency**	**Responsibility**	**Task**	**Frequency**	**Responsibility**
Hibernacula/ Log piles	Hibernacula such as log piles will be left by management and remain undisturbed in discrete locations along the wildlife refuge area e.g., near wildlife ponds. Log-piles require minimal maintenance, with new logs and vegetation added as the older logs break down. No herbicides, fertilisers or pesticides will be used near to log-piles to protect the wildlife they provide habitat for.	As required	Management Company	Hibernacula can be checked by the ecologist during their annual check of the wildlife refuge.	Annually for 5-10 years	Ecologist
Wildlife Ponds	Frequent minor works (e.g., vegetation cutting). Vegetation must not be removed from more than one third of the pond	Once every 1-3 years, if required	Management Company, with guidance from suitably qualified ecologist	Amphibians to be monitored for two breeding seasons post construction works. This survey will include an assessment of the new pond.	Annually for a minimum of 2 years	Ecologist
	Infrequent medium scale works (e.g., coppicing/removal of encroaching trees/shade). Shading will be kept to a minimum around the pond and ideally no more than 10% of the pond will be shaded by trees.	Once every 3-5 years, if required	Management Company, with guidance from suitably qualified ecologist	The management of the wildlife ponds will be assessed once annually during the growing season by an Ecologist, for a period of 5-10 years.	Annually for 5-10 years	Ecologist

Habitat/ Species/ Feature	Operational Phase Management/Enhancement/Mitigation			Operational Phase Monitoring		
	Task	**Frequency**	**Responsibility**	**Task**	**Frequency**	**Responsibility**
	Rare long-term works (e.g., de-silting, profiling etc.)	Once every 5-10 years, if required	Management Company, with guidance from suitably qualified ecologist			
	No herbicide use will occur within at least 3 metres of the margin.	n/a	Management Company			
Bioretention Areas within Wildlife Refuge	**Swale Mowing Approach:** • An annual cutting regime for bioretention areas with the cuttings removed to maintain a nutrient poor soil that favours the growth of wildflowers. • Cutting vegetation in these bioretention areas will take place during late autumn/winter when amphibians are inactive. Ideally the cut will be high (minimum 15 cm) to ensure any frogs or newts present are not harmed.	Annual (late autumn/ winter)	Management Company	The management of the bioretention areas within the wildlife refuge at the Site will be assessed once annually during the growing season by an Ecologist, for a period of 5-10 years.	Annually for 5-10 years	Ecologist

Habitat/ Species/ Feature	Operational Phase Management/Enhancement/Mitigation			Operational Phase Monitoring		
	Task	**Frequency**	**Responsibility**	**Task**	**Frequency**	**Responsibility**
	• Periodic inspection & clean-up of litter.	Annually	Management Company			
Bat Box Scheme	• Erection of a bat box scheme in the form of 4no rocket bat boxes along the wooded margins of the Site.	n/a	Bat Specialist & Contractor	Inspection of bat boxes.	Within one year of erection of bat box scheme.	Bat Specialist
				Register bat box scheme with Bat Conservation Ireland. This will be undertaken for a minimum of 2 years.	Two years	Bat Specialist
				Specific monitoring in relation to the proposed lighting scheme will be undertaken to determine that a level of <1 Lux is achieved along the boundaries of the Proposed Development Site.	Once following the construction phase.	Bat Specialist
Bug Hotels	• At least 5 no. 'Bug hotels' will be installed at various suitable locations across the Site. These structures will be placed as per the instruction of the ECoW, within areas of wildflower or woodland planting.	Once	Developer	The management company should check for damage annually and repair/replace with a similar sized bug hotel as required.	Annually	Management Company

Habitat/ Species/ Feature	Operational Phase Management/Enhancement/Mitigation			Operational Phase Monitoring		
	Task	**Frequency**	**Responsibility**	**Task**	**Frequency**	**Responsibility**
Swift Bricks	• A set of 20 No. swift bricks have been included within the design of the proposed apartment buildings. • Swifts are a self-cleaning bird species that remove their own waste from their nests (in this case, the swift bricks). No maintenance of the bricks required. • Swift Calling System set up (if to be included).	Once	Developer	If being included the Swift Calling System will be set up and checked at the beginning of each Swift breeding season by an Ecologist to ensure it is working correctly (1st May to 31st August)	Annually	Ecologist
General Habitat Management & Species Protection Measures						
Invasive Plant Species	• Physical removal of non-native or invasive shrub or herb species (See IASMP for details). • Chemical control should be used as a last resort.	Monthly or as required	Management Company/ IAS Specialist if required	Monitoring of all IAPS treated at the Site will be carried out for 2 years following treatment by a suitably qualified IAS specialist. Further monitoring may be required if treatment has not been successful.	Annually for 2 years post treatment.	IAS specialist
Meadow Grassland Areas	• Annual cut and collect of grassland meadow habitats. • Strim vegetation to between 10-50 cm and collect	Annually in mid-July or August. A second cut may be required in autumn to reduce the growth of the grassland sward	Management Company	No specific monitoring of meadow areas required.		

Habitat/ Species/ Feature	Operational Phase Management/Enhancement/Mitigation			Operational Phase Monitoring		
	Task	**Frequency**	**Responsibility**	**Task**	**Frequency**	**Responsibility**
	cuttings and compost off site.					
	• Periodic inspection for and if necessary, clean-up of litter	To be undertaken as part of routine litter management.	Management Company			
	• Hand removal of scrub, bramble, bracken or rushes	Annually or as required during the winter months	Management Company			
	• Removal of non-native or invasive shrub or herb species should these be recorded, as per the IAS Management Plan	Annually or as required	Management Company/ IAS Specialist if required			
	• Signage to be erected to ensure management adhere to the pollinator and wildlife friendly management regime.	Once	Developer			
Hedgerows and Treelines	**Hedge Cutting:** • Bramble and Ivy will be retained in hedgerows. • Hedgerows will be retained as high as possible (at least 2.5m above ground level).	Once every three years on rotation between November and January. (some sections cut one year, some left uncut – on a three year cycle).	Management Company	The management of the hedgerow/ treelines at the Site will be assessed once annually during the growing season by an Ecologist, for a period of 5-10 years.	Annually for 5-10 years	Ecologist

Habitat/ Species/ Feature	Operational Phase Management/Enhancement/Mitigation			Operational Phase Monitoring		
	Task	**Frequency**	**Responsibility**	**Task**	**Frequency**	**Responsibility**
	• Hedgerows will be trimmed in an A-shape (where feasible they will be side trimmed only). • Keep tall grassy meadow margins along the bases of each hedgerow.					
	Hedgerow Meadow Margin: • A tall meadow margin (minimum 1.5 m) will be retained along hedgerows.	Hedgerow margin to be managed in two halves where possible: • The half closest to the hedgerow cut only once every few years, • The other half cut annually after mid-July.	Management Company			
	• Removal of non-native or invasive shrub or herb species should these be recorded, as per the IAS Management Plan	Annually or as required	Management Company/ IAS Specialist if required			
	• Physical removal of weeds from hedgerow margins will be undertaken. Herbicides will not be used on hedgerow	n/a	Management Company			

Habitat/ Species/ Feature	Operational Phase Management/Enhancement/Mitigation			Operational Phase Monitoring		
	Task	**Frequency**	**Responsibility**	**Task**	**Frequency**	**Responsibility**
	margins, except in exceptional circumstances where spot control of weeds or invasive flora is required.					
	• Fertilisers will not be spread on the margins of hedgerows	n/a	Management Company			
Amphibians, small mammals, birds	• Grassland habitats managed for biodiversity will be mown/ strimmed from the centre out to allow any wildlife within the grassland a chance to escape	Annually in mid-July or August. A second cut may be required in autumn.	Management Company	Amphibians to be monitored for two breeding seasons post construction works. This survey will include an assessment of the new pond area.	Annually for a minimum of 2 years	Ecologist
	• All hedge cutting to be carried out outside the main breeding bird season, i.e. 1st March to 31st August, in compliance with the Wildlife Act 1976 (as amended).	Once every three years in rotation, between November and January	Management Company			
	• "Amphibian ladders" to be installed where gully pot drains are to be installed, where feasible.	Once	Developer			
	• "Amphibian ladders" to be replaced when required	As per manufacturer guidelines	Management Company			

10 CONCLUSION

This Wildlife Refuge and Biodiversity Management Plan describes the various ways in which biodiversity has been considered in the design of the Proposed Development. The enhancement measures and management approach detailed within this Report will contribute to the support of biodiversity at the Site during its operational lifetime.

The provision of new amphibian breeding, refuge and foraging habitat in the form of wildlife ponds, hibernacula and bioretention areas will benefit local frog populations known to be present at the Site. The placement of bat rocket boxes along a known bat commuting foraging route along the Site's southern and eastern boundaries will provide a net increase in roosting habitat for the local bat population. The increased planting of native trees and the management of the wildlife refuge to maintain areas of exposed bedrock, will benefit the local breeding bird and lizard populations respectively. All in all, the provision of the wildlife refuge will ensure that wildlife can coexist at the Site alongside the proposed residential development, and that habitat connectivity with the surrounding ecological environment is not compromised.

To achieve the goals of this management plan, the management approaches detailed in this Report will be adhered to by the developer, ecologist and management company as will the various recommendations and commitments relating to post-construction monitoring of vegetation management regime, bats, birds and pollinator habitat. Should any of the proposed mitigation and/or monitoring measures recommended in this report fail to be adhered to, the Local Authority shall be informed, and appropriate remedial actions will be agreed upon.

Furthermore, it is recommended that the appointed management company keep a log of all actions undertaken in the event of an audit being undertaken to ensure works are undertaken as described within the Report.

11 REFERENCES

Baker, J., Beebee T., Buckley, J., Gent, A. and Orchard, D. (2011). Amphibian Habitat Management Handbook. Amphibian and Reptile Conservation, Bournemouth.

Browne, J. (2020). Gardening for Biodiversity. [Online] Available at: gardening-for-biodiversity-booklet.pdf (fingal.ie)

Enviroguide (2024) Ecological Impact Assessment for Blackglen Road LRD, Sandyford, Dublin 18.

INVAS Biosecurity (2024). Invasive Alien Species Management Plan (IASMP) prepared for a Large-Scale Residential Development (LRD) at lands at , Sandyford, Dublin 18.

Foulkes, N., Fuller, J., Little, D., McCourt, S., & Murphy, P. (2013). Hedgerow Appraisal System-Best Practice Guidance on Hedgerow Surveying, Data Collation and Appraisal, Woodlands of Ireland, Dublin. Unpublished Report. Available to download at: http://www.biodiversityireland.ie/wordpress/wp-content/uploads/Hedgerow_Appraisal_System.pdf

Gandola (2024). A Rapid Survey & Assessment for Herpetofauna at Blackglen Road LRD Dublin 18.

O'Rourke, A., Loughran, F., & Taisce, p. (2024). *The Irish pond manual: A guide to the creation and management of ponds* (1st Irish edition.). An Taisce.

Pesticide Action Network UK. (2021). Alternatives to Herbicides A Guide for the Amenity Sector. January 2021. [Online] Available at: Alternatives-to-herbicides-a-guide-for-the-amenity-sector.pdf (pollinators.ie)

SEPA (2000) Ponds, pools and lochans Guidance on good practice in the management and creation of small waterbodies in Scotland. Available at: https://www.sepa.org.uk/media/151336/ponds_pools_lochans.pdf

Enviroguide
a DNV company

enviroguide.ie



Head Office
3D, Core C, Block 71, The Plaza, Park West, Dublin 12, D12F9TN, Ireland.
Tel: +353 1 565 4730
Email: info@enviroguide.ie

South West Regional Office
19 Henry Street, Kenmare, County Kerry, V93 CVH0, Ireland.
Tel: +353 646 641932
Email: info@enviroguide.ie

South East Regional Office
M10 Wexford Enterprise Centre, Strandfield Business Park, Rosslare Rd, Strandfield, Kerlogue, Co. Wexford, Y35 W5RD, Ireland.
Tel: +353 1 565 4730
Email: info@enviroguide.ie

Environmental Consultancy Services