

ECOLOGICAL IMPACT ASSESSMENT (EcIA) OF A PROPOSED DEVELOPMENT AT
BUVINDA HOUSE, DUBLIN ROAD, NAVAN, CO MEATH

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Prepared December 2022 by:



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EXECUTIVE SUMMARY

Meath Co. Council are proposing an extension to Meath County Council civic headquarters to include a Council Chamber and Councillors areas, additional office space to facilitate future increase in staff numbers, including meeting rooms and training room. The extension will be designed to optimise natural daylight and ventilation of the internal environment, creating a pleasant and healthy working environment. It will comprise a carbon sequestering mass timber structure with green roofs for water attenuation. A new courtyard garden will soften the image of the ensemble from the road and town beyond, whilst supporting biodiversity and offering bio-retention features to attenuate rainwater run-off.

In June of 2022, FERS Ltd were commissioned to undertake an updated (the original survey work was undertaken in May/June 2020) ecological base-line assessment of the proposed development in order to identify any potential significant ecological constraints.

The purpose of this document is report on the findings of the ecological surveys (2020 and 2022) and to highlight any potential ecological constraints identified in relation to the proposed development.

This report, having assessed the baseline ecology of the Buvinda House site overall, and in particular in that area in which the proposed extension is to be constructed, concludes that the value of the ecological habitat existing at the Buvinda House site is limited. A Natura Impact Statement (NIS) and Environmental Impact Assessment (EIA) screening report have been prepared in concert with (and based upon) this assessment of the baseline of the ecological resource present and all three documents should be read together. Based on the findings of the ecological base-line, NIS and EIA screening report, the development of the proposed extension will have no significant impacts on the ecological resource present (assuming any mitigation measures are implemented).

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1 Introduction

1.1 FERS Company Background

Forest, Environmental Research and Services have been conducting ecological surveys and research since the company's formation in 2005 by Dr Patrick Moran and Dr Kevin Black. Dr Moran, the principal ecologist with FERS, holds a 1st class honours degree in Environmental Biology (UCD), a Ph.D. in Ecology (UCD), a Diploma in EIA and SEA management (UCD) a Diploma in Environmental and Planning Law (King's Inn) and a M.Sc. in Geographical Information Systems and Remote Sensing (University of Ulster, Coleraine). Patrick has in excess of 20 years of experience in carrying out ecological surveys on both an academic and a professional basis. Dr Emma Reeves, senior ecologist with FERS holds a 1st class honours degree in Botany, and a Ph.D. in Botany. Emma has in excess of 15 years of experience in undertaking ecological surveys on an academic and professional basis. Ciarán Byrne, a senior ecologist with FERS holds a 1st class honours degree in Environmental Management (DIT) and a M.Sc. in Applied Science/Ecological Assessment (UCC). Ciarán has in excess of 10 years in undertaking ecological surveys on both an academic and a professional basis.

FERS client list includes National Parks and Wildlife Service, An Bord Pleanála, various County Councils, the Heritage Council, Teagasc, University College Dublin, the Environmental Protection Agency, Inland Waterways Association of Ireland, the Department of Agriculture, the Office of Public Works and Coillte in addition to numerous private individuals and companies.

1.2 Aims of this report

The primary aim of the ecological impact assessment (EcIA) is to provide a baseline of ecological resource present within the study area, allowing a comprehensive assessment of any potential ecological constraints associated with the proposed development.

The primary aims of the Ecological Impact Assessment are:

- To survey habitats, flora and fauna within the study area;
- To produce baseline information on the presence, distribution and conservation status of ecological habitats and species of flora/fauna within the study area;

- To highlight elements or particular areas of specific potential for biodiversity or conservation interest;
- To highlight elements with the potential to damage the ecological integrity of the study area, such as Alien Invasive Plant Species;
- To assess and make recommendations on conservation priorities regarding the identified biodiversity resource of the site;
- To make recommendations regarding future habitat management and ecological monitoring at the site; and
- Where potential impacts are identified, detailed and comprehensive mitigation measures will be proposed, which will include avoidance of an element(s) if, and where deemed necessary.

Please note that the vast majority of the habitat within the overall site (1.54 Ha) is Built Land/Artificial surface. The pockets of other habitats are very small in size. As such, photographs (aerial and ground-based) of these habitats are illustrated rather than the provision of a habitat map.

1.3 Description of proposed project

The proposed project (overall site area 1.54 Ha) entails an extension to Meath County Council civic headquarters to include a Council Chamber and Councillors areas, additional office space to facilitate future increase in staff numbers, including meeting rooms and training room. The current proposal comprises a 3-storey (approx. floor area 3300m²), located to the west of the existing building where parking is currently located, outside of the zone of archaeological interest.

The approximate location of the project area is indicated in Figure 1, Figure 2, Figure 3 and Figure 4. An excerpt from the Engineer's drawing of the proposed layout is indicated in Figure 5.



Figure 1: Approximate location of development site (1:50,000)

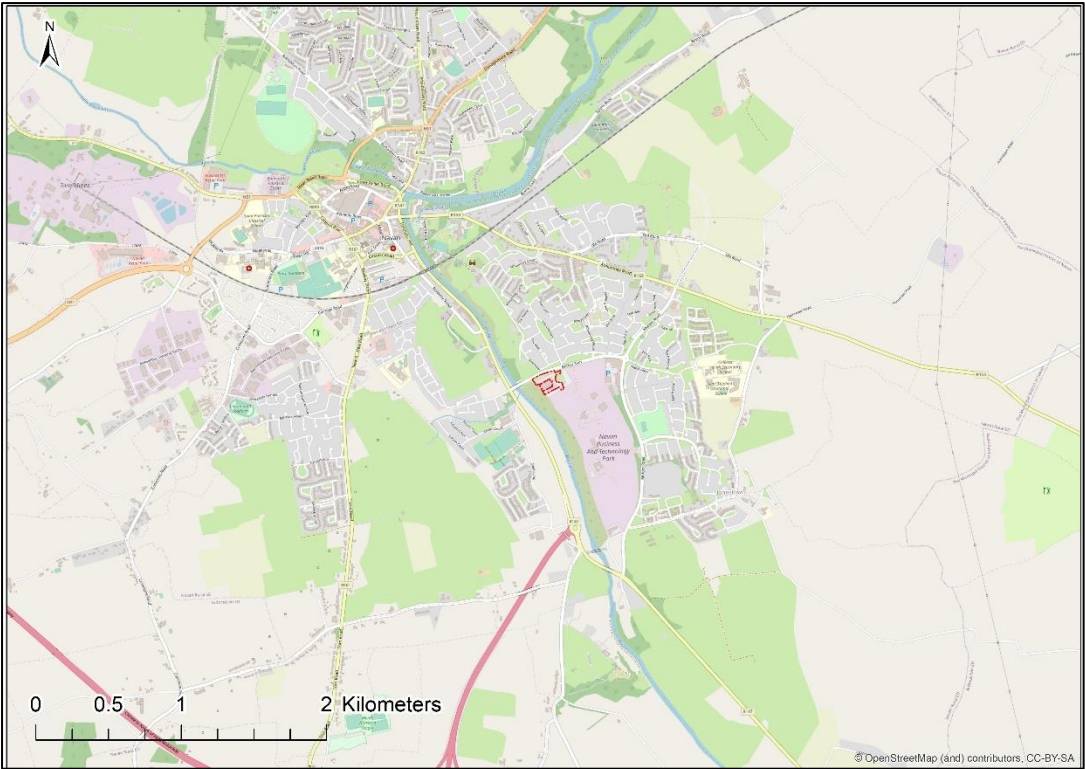


Figure 2: Approximate location of development site (1:25,000)



Figure 3: Approximate location of development site (1:5,000)



Figure 4: Approximate location of development site relative to *environs* (1:2,000)

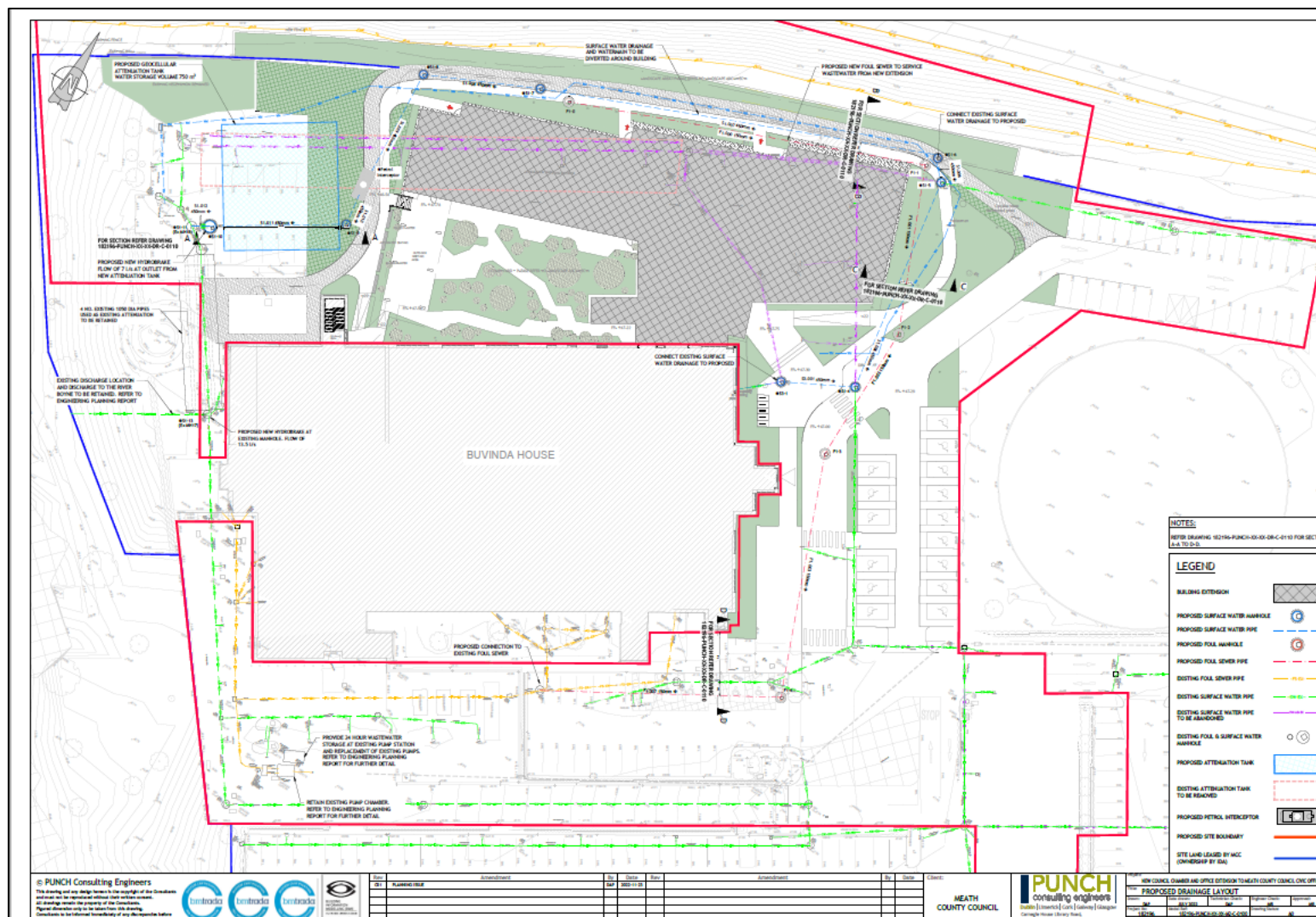


Figure 5: Excerpt from Architect's drawings indicating proposed layout

2 Survey Methodology

2.1 Desk Study

2.1.1 NPWS database

The primary body consulted with regard to matters involving ecology within the Republic of Ireland is the National Parks and Wildlife Service (NPWS). The role of the NPWS is:

- To secure the conservation of a representative range of ecosystems and maintain and enhance populations of flora and fauna in Ireland;
- To implement the EU Habitats and Birds Directives;
- To designate and advise on the protection of Natural Heritage Areas (NHA) having particular regard to the need to consult with interested parties;
- To make the necessary arrangements for the implementation of National and EU legislation and policies and for the ratification and implementation of the range of international Conventions and Agreements relating to the natural heritage; and
- To manage, maintain and develop State-owned National Parks and Nature Reserves.

The desk study as pertaining to this survey involved querying the NPWS database for information pertaining to designated sites (Special Areas of Conservation (SAC), Special Protection Areas (SPA), Natural Heritage Areas (NHA) and Proposed Natural Heritage Areas (pNHA)) occurring within 5 km of the proposed development.

2.1.2 NBDC Database

In addition to consulting the NPWS database, the National Biodiversity Data Centre Database was consulted regarding species of conservation concern recorded as occurring within the vicinity of the study area

2.1.3 Other relevant datasets

Other relevant datasets were queried where appropriate

2.2 Field surveys

2.2.1 Botanical/Habitat surveys

The primary field surveys of vegetation were carried out during May and June 2020 by Dr Patrick Moran, within the optimal timeframe for such surveys. An updated assessment was undertaken in June and July of 2022 by Dr Moran. Nomenclature follows “Webb’s An Irish Flora” (2012 – 8th Edn) and “Mosses and Liverworts of Britain and Ireland a Field Guide” (2010) The botanical and habitat survey consisted of walk-over surveys through study area. The surveys recorded all species of flora observed occurring within the study area. The botanical survey placed particular emphasis on rare, protected or annexed habitats/species by reference to -

- a) Irish Plant Red Data Book;
- b) Habitats listed on Annex I of the EU Habitats Directive;
- c) Species listed on Annex II of the EU Habitats Directive; and
- d) Ecological stepping stones and ecological corridors (as covered under Article 10 of the EU Habitats Directive.

Written descriptions of all habitats within the receiving environment were recorded, to include the dominant species occurring within each habitat. Photographs of representative areas of each habitat are presented. An evaluation of the ecological significance of flora and habitats occurring within the site relative to surrounding habitats was also undertaken. A detailed hedgerow survey based on the Hedgerow Appraisal System (Foulkes *et al* 2013) was not undertaken as no hedgerows of particular significance are present, all areas of this habitat type having been recently planted.

2.2.1.1 Species of Invasive Alien Plants listed on Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011

The human introduction of alien plant species into ecosystems (intentionally or unintentionally) is historically a common-place occurrence. The vast majority of these alien plant species, when introduced into a foreign ecosystem for which they are not adapted, will die without specific care. In a small number of cases, however, these plants can come to dominate the ecosystem into which they have been introduced and become “Invasive.” There is presently a great deal of concern regarding the potential for invasive plant species to threaten the species composition, community structure and overall biodiversity of native Irish habitats. Invasive species can change the character and/or condition of an ecosystem over an extensive area through several mechanisms, depending on the species of

plant and the nature of the habitat. Given the location of the Buvinda site, immediately adjacent to the River Blackwater, specific cognisance was given to the potential presence of Alien Invasive Plant Species within the survey area. There are more than 30 species on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 (as amended). Riparian systems are particularly vulnerable to plant invasions owing largely to the naturally high disturbance frequencies within riparian habitats and the rapidity with which an invasive can spread utilising the medium of flowing water. In addition, there has been an historic tendency for people to plant “ornamental” species beside water. As a result, the vast majority of the species listed on the Third Schedule are associated broadly with riparian systems, occurring within the water course, or proliferating along the bank (see Table 1).

Table 1: List of plant species appearing on the Third Schedule (as amended)

Common Name	Latin Name	Associated with freshwater habitats
American skunk-cabbage	<i>Lysichiton americanus</i>	Yes
Red alga	<i>Grateloupia doryphora</i>	No
Brazilian giant-rhubarb	<i>Gunnera manicata</i>	Yes
Broad-leaved rush	<i>Juncus planifolius</i>	Yes
Cape pondweed	<i>Aponogeton distachyos</i>	Yes
Cord-grasses	<i>Spartina (all species hybrids)</i>	No
Curly waterweed	<i>Lagarosiphon major</i>	Yes
Dwarf eel-grass	<i>Zostera japonica</i>	No
Fanwort	<i>Cabomba caroliniana</i>	Yes
Floating pennywort	<i>Hydrocotyle ranunculoides</i>	Yes
Fringed water-lily	<i>Nymphoides peltata</i>	Yes
Giant hogweed	<i>Heracleum mantegazzianum</i>	Yes
Giant knotweed	<i>Fallopia sachalinensis</i>	Yes
Giant-rhubarb	<i>Gunnera tinctoria</i>	Yes
Giant salvinia	<i>Salvinia molesta</i>	Yes
Himalayan balsam	<i>Impatiens glandulifera</i>	Yes
Himalayan knotweed	<i>Persicaria wallichii</i>	Yes
Hottentot-fig	<i>Carpobrotus edulis</i>	No
Japanese knotweed	<i>Fallopia japonica</i>	Yes
Large-flowered waterweed	<i>Egeria densa</i>	Yes
Mile-a-minute weed	<i>Persicaria perfoliata</i>	Yes
New Zealand pigmyweed	<i>Crassula helmsii</i>	Yes
Parrot's feather	<i>Myriophyllum aquaticum</i>	Yes
Rhododendron	<i>Rhododendron ponticum</i>	No
Salmonberry	<i>Rubus spectabilis</i>	Yes
Sea-buckthorn	<i>Hippophae rhamnoides</i>	No
Spanish bluebell	<i>Hyacinthoides hispanica</i>	No
Three-cornered leek	<i>Allium triquetrum</i>	No
Wakame	<i>Undaria pinnatifida</i>	No
Water chestnut	<i>Trapa natans</i>	Yes
Water fern	<i>Azolla filiculoides</i>	Yes
Water lettuce	<i>Pistia stratiotes</i>	Yes
Water-primrose	<i>Ludwigia (all species)</i>	Yes
Waterweeds	<i>Elodea (all species except E. canadensis)</i>	Yes
Wireweed	<i>Sargassum muticum</i>	Marine/transition

Of the species listed in Part (1) of the Third Schedule, three species are of particular concern owing to the location of the survey area and the potential for spread along the Rivers Boyne:

- Japanese Knotweed (*Fallopia Japonica*);
- Himalayan Balsam (*Impatiens glandulifera*); and
- Giant Hogweed (*Heracleum mantegazzianum*).

The survey for Alien Invasive Species listed in Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 was undertaken in tandem with the habitats/vegetation surveys in both 2020 and updated in 2022.

2.2.2 Habitat Mapping

Please note that the vast majority of the habitat within the overall site (1.54 Ha) is Built Land/Artificial surface. The pockets of other habitats are very small in size. As such, photographs (aerial and ground-based) of these habitats are illustrated rather than the provision of a habitat map.

2.2.3 Bird Surveys

2.2.3.1 General Bird Survey – summer bird surveys

Bird Watch Ireland and the RSPB NI have agreed a list of priority bird species for conservation action on the island of Ireland. These Birds of Conservation Concern in Ireland are published in a list known as the BoCCI List. In this BoCCI List, birds are classified into three separate lists (Red, Amber and Green), based on the conservation status of the bird and hence conservation priority. The Red List birds are of high conservation concern, the Amber List birds are of medium conservation concern and the Green List birds are not considered threatened.

A general bird survey was undertaken by Dr Patrick Moran on the 20th of May 2020 under optimal conditions. Transects through the study area were walked and birds recorded following a modified common bird census or Brown & Shepherd survey. Transects were walked at a slow pace, with all bird species observed noted and recorded and identified. All birds observed were considered to be breeding in the vicinity of the site. McKinnon Lists were not compiled owing to relatively small numbers of species utilising the habitats present (which are primarily BL3). A second bird survey was undertaken on the 5th of June 2020 in order to identify any further species.

An updated bird survey was undertaken on the 13th of June 2022 under optimal conditions. In addition, Passive Acoustic Monitoring Equipment was deployed between the 15th of June and the 20th of June to ensure a comprehensive assessment. The purpose of the bird surveys was to:

- To record any priority species (Annex I, Red or Amber listed) and assess their breeding status within the site;
- To identify any areas of habitat of particular interest with regard to avian biodiversity.

The results represent the combined 2020/2022 findings.

2.2.3.2 Kingfisher Survey

The importance of the biodiversity of Ireland's waterways is reflected in the designation of many of our waterways under the Birds and Habitats Directives. A number of species of European significance occur on our waterways including the Kingfisher (*Alcedo atthis*), which is listed on Annex I of the EU Birds Directive. In 2010 (Cummins *et al*), six major river systems - the Rivers Barrow, Blackwater (Munster), Boyne, Clare, Moy and Nore (in addition to two smaller systems, the Rivers Gill and Illen) – were surveyed in order to assess the distribution and abundance of Kingfisher in representative habitats throughout Ireland. Kingfisher were recorded on all river systems surveyed. Kingfisher are

known to occur along the Boyne, which is part of the River Boyne and River Blackwater SPA, the Qualifying Interest of which is Kingfisher. As such, a Kingfisher survey was undertaken at the site.

The primary goal of Kingfisher surveys was:

- (1) To identify if there are areas suitable for nesting Kingfisher within the site; and
- (2) To note any indications of foraging Kingfisher immediately adjacent.

Kingfisher surveys were carried out by Dr Patrick Moran on the 20th of May and 5th of June 2022 under optimal conditions (clear visibility, no rain, no wind), using a modified version of the methodology as presented in “Assessment of the distribution and abundance of Kingfisher *Alcedo atthis* and other riparian birds on six SAC river systems in Ireland” (Cummins *et al*, 2010) – which was prepared by Birdwatch Ireland for the NPWS. Updated surveys were not deemed necessary in 2022

2.2.4 General Mammal survey

A general mammal survey (including otter as per Reid *et al* 2013) was undertaken at the site by Dr Patrick Moran between the 18th of May and 25th of May 2020. In addition to a survey of the area through direct observations (seeing the animal), observation of faeces, prey remains, shelters, hair, a regularly utilised wildlife trail was identified during this survey and as such, a trail camera was deployed along the trail for period of 1 week. The trail camera is equipped with an infrared flash, enabling the capture of both still and video footage at night without being detected. The location of the deployment of the camera was limited by human activity as the cameras necessarily must be deployed in relatively open locations.

Updated general mammal surveys were undertaken in June 2022. On the 15th of June following a walk-over survey, a trail camera was deployed in the same location as in 2020 and left *in situ* until the 20th of June 2022.

The results represent the combined 2020/2022 findings.



Figure 6: Trail cam deployed along screen at north of carpark (in both 2020 and 2022)

2.2.4.1 Otter Survey

Otter (*Lutra lutra*) is a primarily piscivorous species, depending largely on salmonids but also consuming frogs, crayfish, etc. The trail camera deployed was located at the primary location that any mammal passing through the development footprint would likely utilise. The methodology as presented by NPWS in the Irish Wildlife Manual 76 (National Otter Survey of Ireland 2010/12 – Reid *et al.*, 2013), with a survey being carried out for spraints in tandem with general mammal surveys (but also recording other signs, such as footprints, fish remains, slides, etc.). Habitats on site are not suitable. Otter are known to occur in the river Boyne proximate to the proposed development.

2.2.4.2 Bat surveys

The habitat present at the site is sub-optimal for use by bats. In order to determine usage of the habitat by bats, A Static Monitor was deployed at the site on the 18th of May 2020 following a day-time assessment. This unit records all bat passes during the period 18th May – 22nd May. The unit used was a Pettersson d500X. The Pettersson D500x is an ultrasound recording unit, intended for long-term recording of bat calls. The triggering system allows the device to start recording as a sound is detected. The D500X detects the full spectrum of ultrasound and records in real time. It provides much more detailed data than either frequency division or time expansion detectors. The D500x units were pre-programmed to record all bat-passes occurring during the period between 30 minutes before sunset

and 30 minutes after sunrise throughout the survey. The units used was a Mark II unit, powered by internal batteries, as the survey area was too exposed to human interference to utilise external batteries

The bat survey was updated, with a Pettersson unit being deployed at the same location between the 15th and 20th of June 2022.

The results represent the combined 2020/2022 findings.



Figure 7: Pettersson D500X deployed within habitat suitable for foraging bats (2020 and 2022)

The results represent the combined 2020/2022 findings.

2.2.5 Butterfly

The diversity of Butterfly species occurring on site was surveyed by Dr Patrick Moran on the mid-morning of 20th May 2020 and June 5th under suitable conditions following a modified version of the methodology utilised for the National Butterfly Monitoring Scheme as run by the National Biodiversity Data Centre. Line transects were walked and all butterfly species (and any day-flying moth species) observed recorded. It was not deemed necessary to update the butterfly survey in 2022.

2.2.6 *Bees and Bumblebees*

The diversity of Bee and Bumblebee species occurring on site was surveyed by Dr Patrick Moran on the morning of May 20th and June 5th under suitable conditions following a modified version of the methodology utilised for the National Bumblebee Monitoring Scheme as run by the National Biodiversity Data Centre. It was not deemed necessary to update the bee/bumblebee survey in 2022.

3 Results

3.1 Desk Study

3.1.1 *National Parks and Wildlife Service database*

This section of the desk study primarily involved the consultation of the NPWS data-base, which is publicly accessible. A GIS-based analysis of sites designated for conservation interests (Special Area of Conservation (SAC), Special Protection Area (SPA), Natural Heritage Area (NHA) and Proposed Natural Heritage Area (pNHA)) occurring within 5 km of the survey areas was undertaken. There are no NHAs occurring within 5 km of the survey area. There is one site designated as a pNHA (Boyne Woods, which is contained within the River Boyne and River Blackwater SAC), one site designated as a SAC (River Boyne and River Blackwater SAC) and one site designated as a SPA (River Boyne and River Blackwater SPA) occurring within 5 km of the survey area. The Boundary of the Buvinda House site is immediately adjacent to/within the River Boyne and River Blackwater SAC. is, therefore a Source-Pathway-Receptor (SPR) linkage between the study site and the River Boyne and River Blackwater SAC. In addition, the site is located less than 100m from the River Boyne and River Blackwater SPA. The presence of these S-P-R linkages would indicate that Appropriate Assessment of the proposed development is required.

Maps indicating the location of the Buvinda House site in relation to the pNHA, and the proximity of SAC and SPA are presented in Figure 8, Figure 9 and Figure 10 respectively.

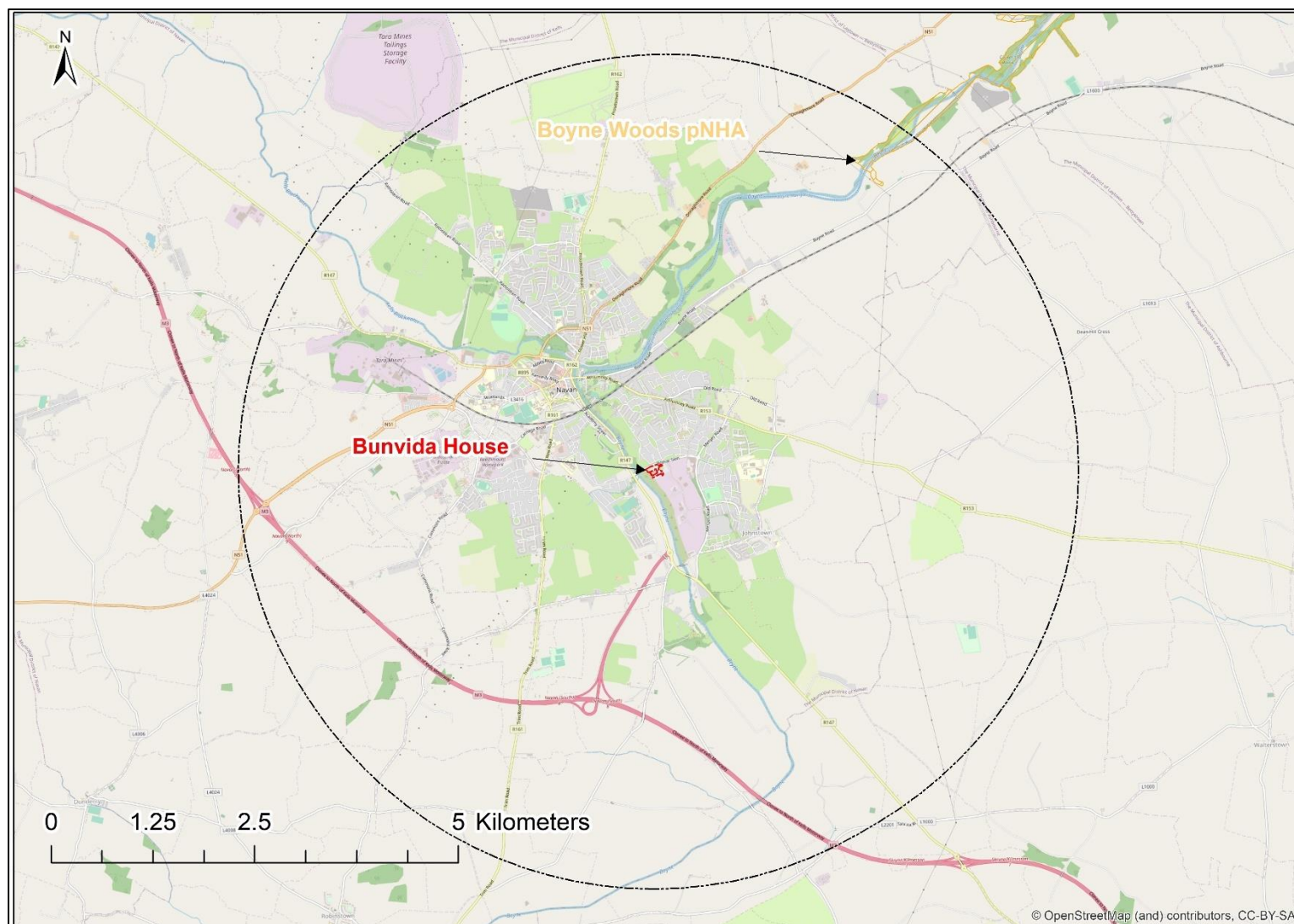


Figure 8: Bunvinda House site location relative to proposed Natural Heritage Areas



Figure 9: Buvinda House site location relative to River Boyne and River Blackwater SAC



Figure 10: Buvinda House site location relative to River Boyne and River Blackwater SPA

3.1.2 National Biodiversity Data Centre database

The NBDC database was accessed on 28/09/22 to query records occurring within the 1 km square (N8866) in which the proposed development is located (see Figure 11). The species of conservation concern as recorded within this polygon are illustrated in Table 2.



Figure 11: Location of polygon queried (National Biodiversity Data Centre)

Table 2: Species of conservation concern located within 1 km square (N8866)

Scientific Name	Common Name	Date of last record
<i>Lissotriton vulgaris</i>	Smooth Newt	31/12/1970
<i>Hirundo rustica</i>	Barn Swallow	24/04/2010
<i>Alcedo atthis</i>	Common Kingfisher	02/10/2020
<i>Apus apus</i>	Common Swift	21/05/2010
<i>Riparia riparia</i>	Sand Martin	24/04/2010
<i>Fallopia japonica</i>	Japanese Knotweed	15/10/2009
<i>Myotis daubentonii</i>	Daubenton's Bat	14/08/2013
<i>Sorex minutus</i>	Eurasian Pygmy Shrew	30/11/2014
<i>Sciurus vulgaris</i>	Eurasian Red Squirrel	29/11/2015
<i>Nyctalus leisleri</i>	Lesser Noctule	10/08/2007
<i>Pipistrellus pipistrellus sensu lato</i>	Pipistrelle	22/08/2007
<i>Pipistrellus pygmaeus</i>	Soprano Pipistrelle	22/08/2007

Numerous other species of conservation concern are also known to occur within this area including Otter (*Lutra lutra*).

3.2 Field Surveys

3.2.1 Botanical/Habitat surveys

The site of the proposed development was visited on a number of occasions during the period 18th May – 5th June 2020, within the optimal time frame for botanical visits. An updated assessment was undertaken in June and July 2022, but no significant differences noted (apart from a decline in the frequency some of the species within the grassland areas forming the western boundary of the site). The vast majority of the site comprises the habitat BL3 – Built Land and Artificial Surfaces. Associated with the car park are numerous areas of amenity grassland (GA2) and planted screening (comprising numerous species such as *Buxus* sp and *Betula Carpinus*. There is an area of recently planted linear habitat comprising immature trees along the northern boundary of the site (see Figure 12) comprised of various species including *Fraxinus excelsior*, *Quercus robur*, *Viburnum opulum*, *Carpinus betula*, *Prunus avium*, *Ilex aquifolium*, *Corylus avellana* and *Alnus glutinosa*. In areas that have not been sprayed, there is some ground flora developing, including *Geranium robertianum*, *Lotus corniculatus*, *Veronica montana*, *Agrostis canina*, *Equisetum arvense*, *Cornus sanguineus*, *Trifolium pratense*, *Vicia cracca*, *Senecio officinalis*, *Fumaria muralis*, *Hedera helix* and *Epilobium ciliatum*. The moss layer, where present is dominated by *Brachythecium rutabulum*. There is a minor degree of movement of wildlife through this corridor, and it was along this corridor that a trail camera and the Pettersson D500X unit were deployed. This area of habitat will be removed. The Arborist assessment of this habitat indicated that the highest rating of any trees was B2 and lower.



Figure 12: Aerial image indicating location of "screening" comprising young trees/shrubs

The western boundary of the site (towards the River Boyne) is comprised of a relatively steeply sloping area of grassland best described as GS2 “Dry meadow/grassy banks”. The area is almost entirely dominated by the grass *Arrhenatherum elatius*. This habitat appears to have seeded with a seed mix as there are some unexpected species present such as Wild Carrot (*Daucus carota*), Salad Burnet (*Sanguisorba minor*), Birds’ Foot Trefoil (*Lotus corniculatus*), Black Medic (*Medicago lupulina*) and Kidney Vetch (*Anthyllis vulneraria*). These species are typically associated with the grassland type GS1 (Dry Calcareous and Neutral grassland), a habitat which is managed through grazing and are not typical of GS2. GS2 is typically dominated by herbaceous species that grow tall or climb the stems of other vegetation. As a result, these atypical herbaceous species are currently being outcompeted by the grasses present, primarily *Arrhenatherum elatius*, which is reaching a height of almost 2 m in places. Under the current management regime, these “out of place” species will disappear (indeed frequency had declined by 2022). Some more typical species, which may have been present in the seed bank include species such as *Cirsium vulgare*, *Plantago lanceolata*, *Fumaria muralis*, *Rumex obtusifolius*, *Anthriscus sylvestris*, *Senecio vulgaris*, *Trifolium repens* in addition to grasses typical of GS2 such as *Dactylis glomerata*, *Holcus lanatus*, *Agrostis stolonifera* and around the edges of the habitat *Poa annua*. There are also numerous ruderals, likely remnants of landscaping. Of note, the habitat is of limited value to pollinators owing to the complete domination of *Arrhenatherum elatius*, which is suppressing the herb layer. During the butterfly, bee and bumblebee surveys, only one butterfly, Common Blue was observed within this habitat, likely owing to the presence of *Lotus corniculatus*. Bumblebees were foraging at the fringes of this habitat.



Figure 13: Grassland habitat relative to river Boyne



Figure 14: Photograph of GS2 *Arrhenatherum elatius* - dominated grassland view 1



Figure 15: Photograph of GS2 *Arrhenatherum elatius* - dominated grassland view 2



Figure 16: *Sanguisorba minor* - a likely "seeded" component of the grassland (2020)



Figure 17: *Anthyllis vulneraria* and *Achillea millefolium*, likely "seeded" components of the grassland (2020)



Figure 18: Ladybird on *Cirsium vulgare*

3.2.2 Species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 (as amended)

No species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 (as amended) were observed during the site surveys (2020 or 2022)

3.3.1 General bird surveys

A total of 18 species of bird were observed to occur (2020 and 2022 combined) within the survey area (see Table 3), which is a rather low figure. Notably, the area around Buvinda House in general supports a large population of foraging starling, which likely nest in surrounding houses. The trail cameras deployed to monitor mammals were most frequently triggered by birds, with some of the records indicated in Figure 21.

Table 3: Birds observed to be present on site

Common Name	Scientific Name
Goldfinch	<i>Carduelis carduelis</i>
Greenfinch	<i>Carduelis chloris</i>
Wood Pigeon	<i>Columba palumbus</i>
Rook	<i>Corvus frugilegus</i>
Jackdaw	<i>Corvus monedula</i>
House Martin	<i>Delichon urbicum</i>
Robin	<i>Erithacus rubecula</i>
Chaffinch	<i>Fringilla coelebs</i>
Swallow	<i>Hirundo rustica</i>
Herring Gull	<i>Larus argentatus</i>
Bluetit	<i>Parus caeruleus</i>

Common Name	Scientific Name
Great Tit	<i>Parus major</i>
Magpie	<i>Pica pica</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>
Starling	<i>Sturnus vulgaris</i>
Wren	<i>Troglodytes troglodytes</i>
Blackbird	<i>Turdus merula</i>
Song Thrush	<i>Turdus philomelos</i>

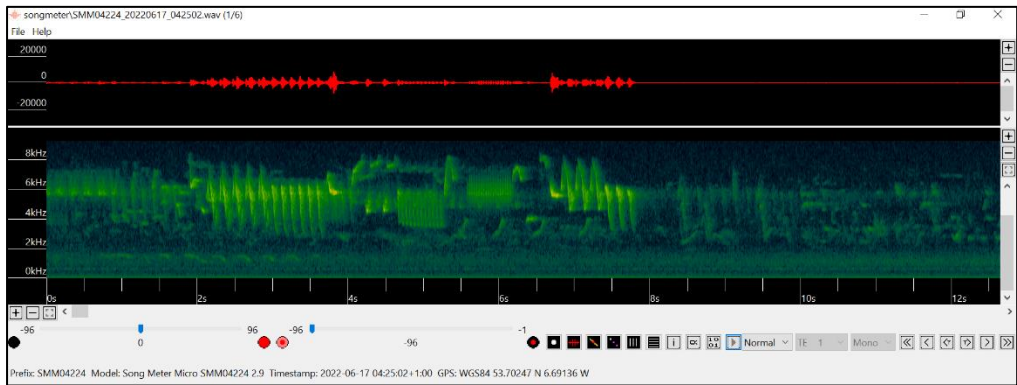


Figure 19: Sonogram of (primarily) Wren recorded in 2022 on site

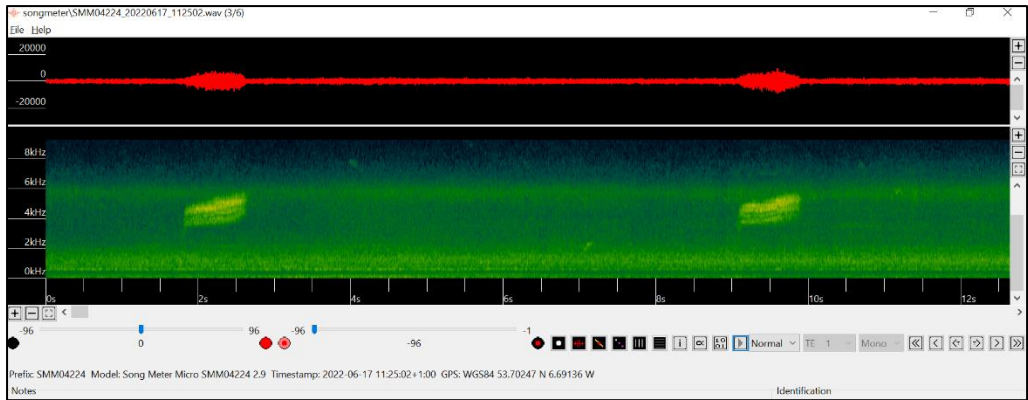


Figure 20: Sonogram of Greenfinch recorded in 2022



Figure 21: A selection of images of birds recorded on trail cam in 2020

3.3.2 Kingfisher Surveys

Targeted Kingfisher surveys were carried out on the 20th of May 5th of June 2020 under optimal conditions (clear visibility, no rain, no wind). Kingfisher were not observed on either occasion and the habitat is not suitable for kingfisher as regards foraging or breeding.

3.4 Mammal Surveys

3.4.1 General Mammal surveys (including badger)

General mammal surveys were carried out by Dr Patrick Moran on the 18th and 20th of May 2020. Very little evidence for a significant population of mammals was observed and it was considered that the extensive fencing may be excluding mammals. An area of habitat that appeared to be utilised as a trail was observed within the habitat comprising the northern boundary (screen comprised of shrubs and young trees, which is developing into a hedgerow), and a trail camera was deployed within this habitat. Evidence was observed for Fox (*Vulpes vulpes*), Hedgehog (*Erinaceous europaeus*), Brown Rat (*Rattus norvegicus*) and Pygmy Shrew (*Sorex minutus*) in 2020. The trail cameras were triggered most frequently by birds, but also by Fox and several Hedgehog. In 2022, with the camera deployed at the same location, no mammals triggered the camera, although birds (primarily blackbird, great tit and robin) triggered the camera regularly.



Figure 22: Still from video of fox recorded on site (2020)



Figure 23: Hedgehog were recorded passing the trail cam on numerous occasions (2020)

3.4.2 Otter Survey

Given the nature of the habitat present within the survey area, Otter are highly unlikely to utilise the habitats present. There were no indications of Otter observed during surveys or on trail cameras.

3.4.3 Bat Surveys

On the 18th of May, a Pettersson D500x unit was deployed on site and left *in situ*. This unit recorded all Bat Passes until the 22nd of May. The identification of bats from the calls recorded on the Pettersson D500X was accomplished through a combination of sound-analysis software (Batsound 4.2, Kaleidoscope and Sonochiro) and manual interpretation. A total of 75 bat passes of three species (Leisler's Bat (46), Common Pipistrelle (9) and Soprano Pipistrelle (20)) were recorded. Of these Illustrations of a sample spectrograph of a Soprano Pipistrelle and the associated power spectrum of one of the calls attained utilising the Batsound software is shown in Figure 24 and Figure 25.



Figure 24: Spectrogram of the echolocation call of a soprano pipistrelle

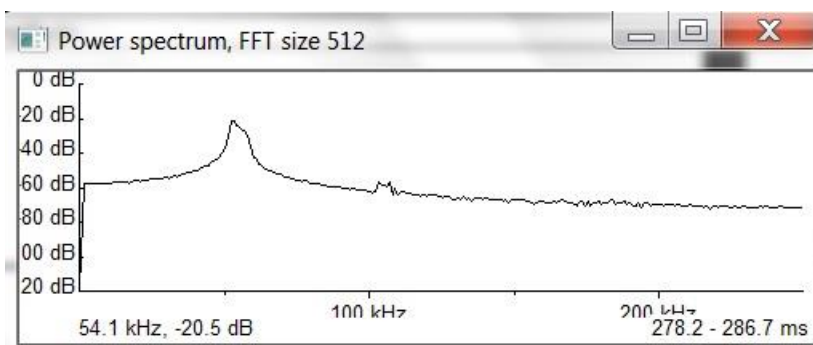


Figure 25: Power spectrum of one of the calls in Figure 24, showing that the maximum power of the call is at a frequency of 54.1 kHz

By mean of an update of bat usage, a Pettersson D500x unit was deployed on site on the 15th of June 2022 and left *in situ* (in the same location as 2022) until the 20th of June 2022, recording all Bat Passes. The identification of bats from the calls recorded on the Pettersson D500X was accomplished through a combination of sound-analysis software (Batsound 4.2 and Sonochiro) and manual interpretation. A total of 50 bat passes of three species (Leisler's Bat (30), Common Pipistrelle (11) and Soprano Pipistrelle (9)) were recorded. The number of bat passes in both 2020 and 2022 were low, with no evidence of a proximate roost.

3.5 Butterflies and Bees

The butterfly and bee surveys were undertaken under optimal conditions (minimum temperature 16°C) on May 25th and June 5th. The numbers of butterflies and bees was in general low, owing to a lack of herbaceous species. At the fringes of the GS2 habitat, a small number of butterfly, bee and bumblebee species were observed. These were not repeated in 2022.

Table 4: Butterfly and day-flying moth species observed

Species name	Common name
<i>Pieris rapae</i>	Small White
<i>Pieris napi</i>	Green veined white
<i>Polyommatus icarus</i>	Common Blue



Figure 26: Common Blue - one of the species observed on site

Table 5: Bee & Bumblebee species observed

Species name	Common name
<i>Apis mellifera</i>	Honey Bee
<i>Bombus lapidarius</i>	Red-tailed Bumblebee
<i>Bombus lucorum</i>	White-tailed Bumblebee
<i>Bombus pascuorum</i>	Common Carder-bee



Figure 27: Honey bee was observed in small numbers on site



Figure 28: Common Carder bee was observed in small numbers at the fringe of GS2 habitat



Figure 29: Red-tailed bumblebee was observed in small numbers on the fringe of GS2 habitat

4 Summary of findings

4.1 Elements or particular areas of specific potential for biodiversity or conservation interest;

The vast majority of the site is of limited ecological value being comprised of habitats such as “Built Land and Artificial Surfaces (BL3) and Amenity Grassland (GA2). Given the proximity of the site to the optimal habitat present for numerous species of flora and fauna at the River Boyne corridor and associated habitats, the majority of habitats are of low ecological value. The area of GS2 is of some biodiversity value, but the species composition of the habitat will change drastically over the coming years as a result of management. Under the current management, this area is likely to become rank, dominated by relatively few tussock forming grass species. This habitat is of value to invertebrates and species feeding on invertebrates. For the most part, the habitats present are of low local biodiversity/conservation importance. There was a relatively low number of bat passes recorded, but the River Boyne and associated habitat is known to support a wide variety, and high numbers of bat species.

4.2 Elements with the potential to damage the ecological integrity of the study area, such as Alien Invasive Plant Species

There were no plant species listed in Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 observed on site. Given the proximity of the site to the River Boyne and River Boyne and River Blackwater SA/SPA, measures to consider the import/spread of Third Schedule species has been taken into account as part of the CEMP prepared by Punch Consulting Engineers in order to prevent the inadvertent introduction of any such species to the site.

Bats were record utilising the area in small numbers, although no roosting activity in the vicinity was indicated. Changes in the lighting regime has the potential to impact on bat species.

4.3 Presence and effectiveness of ecological corridors within the study area

The River Boyne and associated ecological corridor of habitats is immediately adjacent to the proposed development. This ecological corridor is of National, an indeed given its’ Natura 2000 site

designation of International importance, and there must be no negative impacts of the proposed development on this ecological corridor.

4.4 Conservation priorities regarding the identified biodiversity resource of the site

The conservation priorities regarding the identified biodiversity resource identified should concentrate on the River Boyne and associated corridor of habitats adjacent. The primary conservation priorities should be:

- To maintain and enhance the water quality of the River Boyne;
- To maintain/enhance the ecological integrity of the Boyne River ecological corridor and Natura 2000 sites of which it is a component); and
- To prevent introduction of species of Alien Invasive Plants to the proposed site.

4.5 Potential impacts and mitigation measures

4.5.1 Potential Impacts

The primary impacts during the construction phase will be:

- Potential impacts on the water quality of the River Boyne;
- Potential impacts associated with the introduction to site of propagules of Alien Invasive Plant Species;
- Potential disturbance impacts.

The primary impact during operation will be:

- Potential disturbance associated with, for example lighting.

4.5.2 Mitigation Measures

4.5.2.1 Impacts on water quality (construction)

The proposed development is proximate to the River Boyne and associated ecological corridor, a feature of International ecological significance. There is always potential for contamination/pollution events to occur whenever construction is undertaken in the vicinity of water bodies through accidents, spills, etc. No major construction activities should be undertaken within 50m of the River Boyne.

A comprehensive Construction Environmental Management Plan and Engineering Planning Report have been prepared by Punch Consulting Engineers outlining detailed mitigation measures that will be implemented in order to ensure that there are no negative impact associated with the development.

During all construction works, protection of water quality is paramount, and should be ensured by implementing the following generic measures in addition to any site-specific measures as identified:

Any contractor shall undertake all proposed works in such a manner as to avoid degradation of water quality by pollution (in particular, from hydrocarbons, chemicals.).

Measures to be taken to prevent the above shall include the following:

- The Undertaker's method statement should make specific reference to measures for the protection of water quality;
- Undertaker's plant, equipment etc. shall be free of any mechanical defects, and be well maintained so as to prevent soil or fuel leaks;
- Undertaker's plant, equipment etc. must arrive at the site free from propagules of any Alien Invasive Plant Species;
- The Undertaker's method statement should make specific reference to measures for the protection of water quality, to include measures to ensure no spillage of fuel or cement/lime-based material or any other leakages occur to any drains, etc. for the duration of the works;
- All works will be undertaken in accordance with the following best practice guidelines:
 - CIRIA Control of Water Pollution from Construction sites – Guidance for Consultants and Contactors (2001).
 - Eastern Regional Fisheries Board Guidance Notes 'Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites' (Eastern Regional Fisheries Board, 2006);
 - NRA Guidelines (2006) NRA Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes.

4.5.2.2 Potential impacts associated with Alien Invasive (Third Schedule) Plant Species (construction)

Given the ecological sensitivity of the adjacent habitat and the requirement for the importation of material, there is a significant potential for the introduction of propagules of one or more Alien Invasive Plant species. The three primary threats are Japanese Knotweed, Himalayan Balsam and Giant Hogweed.

4.5.2.2.1 Japanese Knotweed – *Fallopia japonica*

This plant is a rhizomatous perennial, capable of reaching 2m in height. This plant spreads exclusively by vegetative means, spreading very aggressively under disturbed conditions. The plant is capable of forming extensive monoculture stands. There is a negative impact on ecosystem function and biodiversity through a number of mechanisms – primarily through the shading-out of native plants due to the rapidity with which large stands of the plant can form. In addition, this plant has a deleterious effect on the banks of waterways owing to the fact that during the winter, when *F. japonica* dies back, there is little or no vegetation growing underneath, and hence nothing to prevent erosion of the bank. This species is well established in Ireland and is rapidly spreading throughout the country, especially by roadsides and along watercourses.



Figure 30: Established population of Japanese Knotweed occurring at a quarrying operation in Wexford

4.5.2.2.2 Himalayan Balsam

Impatiens glandulifera is one of the tallest annuals occurring in Europe, growing up to 150 cm. It is a native of the Himalayas and has rapidly become one of the most problematic of invasive species in Europe, particularly along watercourses. The dominance of large stands of *I. glandulifera* along watercourses causes problems for stream management in addition to the negative impact on native flora due to the formation of large monoculture stands. The massive production of nectar to induce pollinators, in addition to the “explosive” means by which seeds are spread (pods explode on contact, hurling seeds away from the parent plant) contribute to the ability of this plant to out-compete native species. This plant is rapidly becoming a serious threat to biodiversity along Ireland’s waterways.



Figure 31: Himalayan Balsam

4.5.2.2.3 Heracleum mantegazzianum, Giant Hogweed.

Giant Hogweed, as its name suggests, can reach heights of 5m. This perennial reproduces exclusively by seed, but can produce up to 100,000 seeds per individual, with up to 90% germination rate. In addition to this, this plant is capable of self-fertilisation, which means that one plant is capable of resulting in the invasion of a new habitat. Like *F. japonica*, and *I. glandulifera*, it is the tendency of Giant Hogweed to grow very tall very quickly, forming a monospecific stand that results in the negative impact of this species on native biodiversity. It is, however, the phototoxic sap of this species, and the increasing number of human injuries associated with this sap that has made *H. mantegazzianum* one of the most problematic alien invasive plant species throughout Europe.



Figure 32: Giant Hogweed occurring at a location in Meath along the River Boyne

All three of these Alien Invasive Plant Species occur along the River Boyne and are becoming increasingly problematic.

The CEMP has taken into account the potential introduction of propagules of any species listed in Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 (as amended).

4.5.2.2.4 Potential impacts associated with disturbance (construction and operation)

The River Boyne and associated habitats are an ecological corridor of National and International significance and are of particular importance to bats. There is a potential for any lighting associated with the proposed development (during construction and/or operation) to impact negatively on fauna and in particular, species of bat such as Daubenton's Bat. Any major changes to the external lighting regime must be subject to a comprehensive assessment of potential impact on the utilisation of adjacent habitat by bats and a Conservation Management Plan to include annual monitoring of usage of the riparian corridor by bats should be undertaken if lighting is likely to impact the riparian corridor. Of note, the current development calls for very little change as regards external lighting with the vast majority of existing lampposts being retained.

The proposed development is unlikely to have any significant negative impact as regards disturbance on Otter or Kingfisher owing to the distance of the site from the river and lack of suitable habitat assuming no negative impact on hydrology/water quality.

4.6 Recommendations regarding future habitat management and ecological monitoring at the site

4.6.1 *Habitat Management*

There are a number of recommendations regarding future habitat management at the site:

- 1) In order to enhance the overall biodiversity and conservation significance of the site, it is recommended that a biodiversity and habitat management plan be drawn up and implemented such as to maximise benefits to local ecology – for example management of some grassland areas within the site such as to encourage the development of semi-natural grassland;
- 2) An Alien Invasive Plant Control and Management Plan has been included as a component of the CEMP in order to ensure that species such as Japanese Knotweed, Himalayan Balsam or Giant Hogweed are not imported to the site during construction;
- 3) The River Boyne and adjacent habitats immediately adjacent to the proposed development are of high importance for bats. It is recommended that a Bat Conservation Management Plan be drawn up and implemented for the study area in order to ensure that any development within the study area is conducive to the continued use of the habitats by bats.

4.6.2 *Ecological monitoring*

Owing to the anthropogenic nature of the habitats present, there are limited species of conservation concern recorded as occurring at/within the vicinity of the proposed development. The proposed development is, however, immediately adjacent to an important ecological corridor for foraging and commuting bats. It is recommended that annual monitoring, to include a baseline assessment prior to construction, to include the River Boyne and habitats between the River Boyne and the proposed development site be undertaken in order to assess any potential impacts on the local bat population.

5 Conclusions

The proposed development will not have any significant negative ecological impacts, assuming mitigation measures are implemented, and the proposed development is undertaken in accordance with the Wildlife Act (1976) as Amended.

It must be noted that a Natura Impact Statement and an Environmental Impact Assessment screening report have been prepared for the proposed development.

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