



RECEIVED: 14/08/2023

**Natura Impact Statement**  
**for proposed Residential Development at Tinakilly, Rathnew, Co.**  
**Wicklow**

prepared for Ardale Construction Limited

on behalf of Keldrum Ltd

Scott Cawley, College House, 71 – 73 Rock Road, Blackrock, Co. Dublin, A94 F9X9, Ireland

---

Tel+353(1)676-9815 Fax +353(1) 676-9816

---

## Document Control

RECEIVED: 14/08/2023

<b>Project Title</b>	Tinakilly Phase 2	<b>Project No.</b>	210131	
<b>Document Title</b>	Natura Impact Statement	<b>Status</b>	Final	
<b>Revision</b>	<b>Issue Date</b>	<b>Author</b>	<b>Reviewed By</b>	<b>Approved By</b>
D01	05/07/2023	EC	TR-	CC
11	01/08/2023	EC	TR	CC

© Copyright Scott Cawley Limited.

This report has been prepared by Scott Cawley Ltd. for the sole use of our client (the 'Client') and, unless otherwise agreed in writing by Scott Cawley Ltd., no other party may use, make use of or rely on the contents of this report. No liability is accepted by Scott Cawley Ltd. for any use of this report, other than the purpose for which it was prepared.

This report has been prepared by Scott Cawley Ltd. in accordance with the particular instructions and requirements of our agreement with the Client, the project's budgetary and time constraints and in line with best industry standards. The methodology adopted and the sources of information used by Scott Cawley Ltd. in providing its services are outlined in this report. The scope of this report and the services are defined by these circumstances.

Where the conclusions and recommendations contained within this document are based upon information provided by others than Scott Cawley Ltd., no liability is accepted on the validity or accuracy of that information. It is assumed that all relevant information has been provided by those parties from whom it has been requested and that the information is true and accurate. No independent verification of any documentation or information supplied by others has been made.

The conclusions presented in this report represent Scott Cawley Ltd.'s best professional judgement based on review of site conditions observed during the site visit (if applicable) and the relevant information available at the time of writing. Scott Cawley Ltd. has used reasonable skill, care and diligence in compiling this report and no warranty is provided as to the report's accuracy.

**Table of Contents**

1 Introduction .....4

2 Legislative Context.....5

3 Methodology .....6

    3.1 Scientific and Technical Competence Relied Upon.....6

    3.2 Guidance and Approach.....7

    3.3 Assessment Methodology.....7

    3.4 Desktop Study .....9

    3.5 Consultations .....10

    3.6 Baseline Surveys.....10

4 Description of the Proposed Development .....14

5 Overview of the Receiving Environment .....15

    5.1 European Sites .....15

6 Potential Impacts, Zone of Influence and Identifying European Sites at Risk of Effects .....36

    6.1 Habitat loss and fragmentation .....36

    6.2 Habitat degradation as a result of hydrological impacts .....36

    6.3 Habitat degradation as a result of Hydrogeological impacts.....43

    6.4 Habitat degradation as a result of introducing/spreading non-native invasive species.....43

    6.5 Disturbance and displacement impacts .....44

    6.6 Mortality risk .....44

    6.7 Summary .....45

7 Assessment of Effects on European Sites .....46

    7.1 The Murrough Wetlands SAC [002249] .....46

    7.2 The Wicklow Mountains SAC [002122].....61

    7.3 The Murrough SPA [004186].....86

8 In Combination Assessment .....92

    8.1 Analysis of Potential In Combination Effects .....92

    8.2 Conclusion of In Combination Assessment.....93

9 NIS Conclusion .....94

RECEIVED: 14/08/2023

Appendix I: Planning polices/objectives relating to the protection of European sites and water quality

Appendix II: Species listed under the EU Habitats and Birds Directive or in the Birds of Conservation Concern of Ireland 2020-2026 recorded as part of the desktop study and through survey.

Appendix III: Triturus Environmetnal Ltd – Aquatic Survey Report

## 1 Introduction

This report has been prepared by Scott Cawley Ltd. for the applicant, Keldrum Ltd., who is seeking permission for construction of a large-scale residential development (LRD) including 352 no. residential units, parking for cars and bicycles, private, communal and public green spaces and access routes; at Tinakilly, Rathnew, Co. Wicklow (hereinafter referred to as the proposed development). A full description of the proposed development and its phases is provided in Section 4 of this NIS.

This NIS has been prepared in accordance with the provisions of Part XAB of the Planning and Development Act, 2000 (as amended) and in accordance with the requirements of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive).

It considers the implications of the proposed development, on its own and in combination with other plans or projects, for European sites<sup>1</sup> in view of the conservation objectives of those sites. It includes a scientific examination of evidence and data to identify and assess the implications of the proposed development for any European sites in view of the conservation objectives of those sites. It considers whether the proposed development, by itself and in combination with other plans or projects, would adversely affect the integrity of any European sites. In reaching a conclusion in this regard consideration is given to any mitigation measures necessary to avoid or reduce any potential negative impacts.

Following an examination, analysis and evaluation of all relevant information and in view of best scientific knowledge, and applying the precautionary principle, the AA Screening Report (Scott Cawley Ltd 2023) concluded that there is the possibility for significant effects on European sites, either from the proposed development alone or in combination with other plans and projects.

Accordingly, a Stage Two Appropriate Assessment and the preparation of a Natura Impact Statement (NIS) of the proposed development is required in this instance as, in the professional opinion of Scott Cawley Ltd, it cannot be excluded, in view of best scientific knowledge and on the basis of objective information, that the proposed development, either individually or in combination with other plans or projects, will not have a significant effect on some European site(s) in view of their conservation objectives.

The purpose of this NIS is to provide an examination, analysis and evaluation of the potential impacts of the proposed development on European sites and to present findings and conclusions with respect to the proposed development in light of the best scientific knowledge in the field. This NIS will inform and assist the competent authority, Wicklow County Council, in carrying out its Appropriate Assessment as to whether or not the proposed development will adversely affect the integrity of any European sites, either alone or in combination with other plans and projects, taking into account their conservation objectives.

It is the considered view of the authors of this NIS (Scott Cawley Ltd.) that, following the effective implementation of the mitigation measures proposed in Sections **Error! Reference source not found.** and 7.2.4, the proposed development will not, individually or in combination with other plans or projects, have any adverse effect on the integrity of any European sites in view of their conservation objectives.

The proposed development is neither connected with nor necessary to the management of any European sites.

---

<sup>1</sup> The Natura 2000 network of sites are defined under the Habitats Directive (Article 3) as a European ecological network of special areas of conservation, composed of sites hosting the natural habitat types listed in Annex I and species listed in Annex II, and special protection areas classified pursuant to the Birds Directive (2009/147/EC). The aim of the network is to aid the long-term survival of Europe's most valuable and threatened species and habitats. In Ireland, these sites are designed as *European sites* – as defined under the Planning and Development Acts and/or Birds and Habitats Regulations as (a) a candidate site of Community importance, (b) a site of Community importance, (c) a candidate special area of conservation, (d) a special area of conservation, (e) a candidate special protection area, or (f) a special protection area. They are commonly referred to in Ireland as candidate Special Areas of Conservation (cSACs) and Special Protection Areas (SPAs).

## 2 Legislative Context

The Birds and Habitats Directives - Council Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the Birds Directive) and Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive) – require Ireland to establish protected sites as part of a European wide network of sites (the Natura 2000 network which are known in Ireland as European sites) for habitats and species that are of international importance for conservation. In Ireland, European sites include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). SACs are selected for habitats listed on Annex I of the Habitats Directive (including priority Annex I habitat types which are in danger of disappearance) and species listed on Annex II. SPAs are selected for bird species (listed on Annex I of the Birds Directive), regularly-occurring populations of migratory bird species (such as ducks, geese and waders), and areas of international importance for migratory birds. The specified habitats and species for which each SAC and SPA is selected, correspond to the qualifying interests (in the case of SACs) or special conservation interest species (in the case of SPAs) for the sites, for which conservation objectives are prepared.

Article 6(3) of the Habitats Directive states that:

*‘Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.’*

This provision is transposed into Irish law by Part XAB of the Planning and Development Acts 2000 as amended. Section 177U(4) of the said Acts provides for screening for Appropriate Assessment as follows:

*‘The competent authority shall determine that an appropriate assessment of [...] a proposed development [...] is required if it cannot be excluded, on the basis of objective information, that the [...] proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site.’*

Section 177U(5) provides as follows:

*‘The competent authority shall determine that an appropriate assessment of a [...] proposed development, [...], is not required if it can be excluded, on the basis of objective information, that the [...] proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site.’*

Section 177T(1) and (2) provide that a NIS is *‘a statement, for the purposes of Article 6 of the Habitats Directive, of the implications of a proposed development, on its own or in combination with other plans or projects, for one or more than one European site, in view of the conservation objectives of the site or sites’ and specifies that it ‘shall include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for one or more than one European site in view of the conservation objectives of the site or sites’.*

The Court of Justice of the European Union (CJEU) has made a number of rulings in relation to Appropriate Assessment, regarding when it is required, its purpose and the standards it should meet. Two of the key rulings include, Case C-127/02 Waddenzee where the CJEU found that *‘Any plan or project not directly connected with or necessary to the management of the site is to be subject to an appropriate assessment of its implications for the site in view of the site’s conservation objectives if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in combination with other plans or projects’* and that the plan or project may only be authorised *‘where no reasonable scientific doubt remains as to the absence of such effects’*, and Case C-258/11 where the CJEU found that *‘[The Appropriate Assessment] cannot have lacunae and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the works proposed on the protected site concerned’.*

Consideration has been given in the preparation of this report, to the evolution in interpretation and application of directives and national legislation arising from jurisprudence of the European and Irish courts, in respect of Article 6 of the Habitats Directive.

### 3 Methodology

#### 3.1 Scientific and Technical Competence Relied Upon

This NIS was authored by Eoin Cussen and reviewed by Tim Ryle and Colm Clarke MCIEEM of Scott Cawley Ltd. The background and experience of the author and contributors to this report are set out below.

Eoin Cussen is a Senior Ecologist with Scott Cawley Ltd. Eoin holds a BSc (Hons) in Zoology from University College Cork and MSc (Hons) in Ecological Assessment from the same institution. Eoin is an experienced ecologist with over 5 years' professional postgraduate experience in ecological consultancy including planning related casework for state and non-governmental organisations within Ireland and the UK, input to and preparation of Appropriate Assessment (AA) screenings, Natura Impact Statements, Preliminary Ecological Assessments and Ecological Impact Assessments, and a wide range of experience of ecological surveys for protected habitats and species including flora, mammals, bats and birds.

Tim Ryle is a Principal Ecologist with Scott Cawley Ltd. He holds an honours degree in Botany from University College Dublin and was later awarded a Ph.D. from the same institution. He is a full Member of the Institute of Environmental Scientists. Tim is an experienced ecological consultant with twenty years' experience in private consultancy in designing, undertaking and managing a wide range of ecological surveys and in assessing impacts and designing mitigation measures and biodiversity enhancements, in particular for protected species including badgers, otters, bats, birds, amphibians as well as habitats of conservation importance. He is also experienced in undertaking Appropriate Assessment for small-scale development projects and larger infrastructural projects, land plans as well as national/government plans. Tim acted as the initial reviewer on this NIS as part of Scott Cawley's internal quality assurance (QA) procedures.

Colm Clarke is a Principal Ecologist with Scott Cawley and has over eight years' experience in ecological consultancy. He obtained an honours degree in Natural Sciences, with a specialisation in Botany, from Trinity College Dublin, and a Masters in Biodiversity and Conservation from the same institution. Colm is a full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM), a member of the Irish Environmental Law Association (IELA), and chairperson of the Dublin Bat Group (an affiliate group of Bat Conservation Ireland (BCI)). He is part of the CIEEM's EclA Accreditation Working Group, which is focused on driving quality standards in EclA across Ireland and the UK. He keeps abreast of the latest developments in environmental case law and best practice in ecological assessment through attendance at training courses, and IELA events. Colm regularly completes Ecological Impact Assessment (EclA), Biodiversity Chapters of Environmental Impact Assessment Reports (EIAR), Appropriate Assessment Screening reports, Natura Impacts Statements and Technical Review of AA reports on industrial, residential and large infrastructure projects. Colm reviewed this NIS as part of Scott Cawley's internal QA procedures.

### 3.2 Guidance and Approach

This NIS has been prepared having regard to the following documents.

#### European Commission Guidance

- *Assessment of Plans and Projects in Relation to Natura 2000 sites: Methodological Guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (European Commission, 2021);
- *Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC* (European Commission, 2019);
- *Communication from the Commission on the Precautionary Principle* (European Commission 2000)<sup>2</sup>;
- *Nature and Biodiversity Cases – Ruling of the European Court of Justice* (European Commission 2006;)
- *Article 6 of the Habitats Directive – Rulings of the European Court of Justice* (European Commission Final Draft September 2014); and,
- *Interpretation Manual of European Union Habitats. Version EUR 28.* (European Commission, 2013).

#### Irish Guidance

- *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities* (Department of Environment, Heritage and Local Government 2010 revision) ;
- *Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPW 1/10 & PSSP 2/10* (NPWS, 2010); and,
- *OPR Practice Note PN01. Appropriate Assessment Screening for Development Management* (Office of the Planning Regulator, 2021).

In addition, regard has been had to the following guidance in characterising impacts, including determining magnitude and significance of impacts, as relevant in the application to Appropriate Assessment and European sites:

- *Guidelines for Ecological Impact Assessment in the UK and Ireland* (Chartered Institute of Ecology and Environmental Assessment, 2018).

### 3.3 Assessment Methodology

The proposed development (including the proposed design, construction methodologies and operational effects) was analysed and assessed with respect to the requirements of Article 6(3) of the Habitats Directive and in consideration of all potential impact sources and pathways connecting the proposed development

---

<sup>2</sup> The precautionary principle is a guiding principle that derives from Article 191 of the Treaty on the Functioning of the European Union and has been developed in the case law of the European Court of Justice (e.g. ECJ case C-127/02 – Waddenzee, Netherlands).

This guidance document notes that the precautionary principle “covers those specific circumstances where scientific evidence is insufficient, inconclusive or uncertain and there are indications through preliminary objective scientific evaluation that there are reasonable grounds for concern that the potentially dangerous effects on the environment, human, animal or plant health may be inconsistent with the chosen level of protection”.

Applying the precautionary principle in the context of screening for appropriate assessment requires that where there is uncertainty or doubt about the risk of significant effects on a European site(s), it should be assumed that significant effects are likely and AA must be carried out.

to European sites, in view of the conservation objectives supporting the conservation condition of all European sites' QIs / SCI.

From this, the zone of influence of the proposed development was defined. Based on the identified impacts, and their zone of influence, the European sites potentially at risk of any direct or indirect impacts were identified. The assessment presented in this NIS has been undertaken

In establishing which European sites are potentially at risk (in the absence of mitigation) from the proposed development, a source-pathway-receptor approach was applied. In order for an impact to occur, there must be a risk enabled by having a source (e.g. water abstraction or construction works), a receptor (e.g. a European site or its Qualifying Interest(s) (QIs) or Special Conservation Interest(s) (SCIs) species), and a pathway between the source and the receptor (e.g. pathway by air for air borne pollution, or a pathway by a watercourse for mobilisation of pollution). For an impact to occur, all three elements must exist; the absence or removal of one of the elements means there is no possibility for the impact to occur.

The identification of source-pathway-receptor connection(s) between the proposed development and European sites essentially is the process of identifying which European sites are within the zone of influence of the proposed development, and therefore potentially at risk of significant effects. The zone of influence is defined as the area within which the proposed development could affect the receiving environment such that it could potentially have significant effects on the QI habitats or QI/SCI species of a European site, or on the achievement of their conservation objectives (as defined in CIEEM, 2018).

The identification of a source-pathway-receptor risk does not automatically mean that significant effects will arise. The likelihood of significant effects will depend upon the characteristics of the source (e.g. extent and duration of construction works), the characteristics of the pathway (e.g. direction and strength of prevailing winds for air borne pollution) and the characteristics of the receptor (e.g. the sensitivities of the European site and its QIs/SCIs). However, identification of the risk does mean that there is a possibility of ecological or environmental damage occurring, with the significance of the effect depending upon the nature and exposure to the risk and the characteristics of the receptor. In this case, where there is uncertainty, the precautionary principle has been applied.

This assessment has been undertaken in consideration of all potential impact sources and pathways connecting the proposed development to European sites, in view of the conservation objectives supporting the conservation condition of the sites' QIs/SCIs.

The conservation objectives relating to each European site and its QIs/SCIs are expressed generally for SACs as "to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the cSAC has been selected", and for SPAs "to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA".

Following on from this, and as defined in the Habitats Directive, favourable conservation status (or condition, at a site level) of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable

The favourable conservation status (or condition, at a site level) of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis



Where site-specific conservation objectives have been prepared for a given European site, these include a series of specific attributes and targets against which effects on conservation condition, or integrity, can be measured, i.e. an impact which affects the achievement of favourable conservation condition, as measured by the attributes and targets, is an impact on site integrity.

In the case of some European sites, site-specific conservation objectives are not available, or have not been published. Where first order site-specific conservation objectives have been published, e.g. The Murrrough SPA), no attributes or targets are as yet defined. Where that is the case, sample site specific attributes and targets for a given QI / SCI have been compiled, based on those from other relevant European sites, as a guide in assessing how the conservation condition of these sites could potentially be affected by the proposed development.

In the case of some QIs/SCIs in certain European sites, the conservation objective is to restore rather than maintain conservation condition and this distinction is taken into account in the assessment; as is any legacy damage to European sites that has occurred since their designation, insofar as possible.

To the extent that the assessment carried out as part of the preparation the NIS has found that the proposed development has the potential to impact on European sites, avoidance and mitigation measures have been included as part of the proposed works to ensure that, in view of the European sites' conservation objectives, the proposed development will not adversely affect the integrity of the sites concerned.

### 3.4 Desktop Study

The desktop data sources used to inform the assessment presented in this report are as follows (accessed on the 20th June 2023):

- Online data available on European sites and protected habitats/species as held by the National Parks and Wildlife Service (NPWS) from [www.npws.ie](http://www.npws.ie)<sup>3</sup>, including conservation objectives documents
- Online data available on protected species as held by the National Biodiversity Data Centre (NBDC) from [www.biodiversityireland.ie](http://www.biodiversityireland.ie)
- Information on the surface water network and surface water quality in the area available from [www.epa.ie](http://www.epa.ie)
- Information on groundwater resources and groundwater quality in the area available from [www.epa.ie](http://www.epa.ie) and [www.gsi.ie](http://www.gsi.ie)
- Ordnance Survey of Ireland mapping and aerial photography available from [www.osi.ie](http://www.osi.ie)
- Spatial information relevant to the planning process including land zoning and planning applications from Department of Housing Planning, Community and Local Government web map portal. Available from <https://myplan.ie/>
- Information on local biodiversity policies and objectives within the Wicklow County Development Plan 2022-2028<sup>4</sup>, and County Wicklow Biodiversity Plan 2010-2015<sup>5</sup>

---

<sup>3</sup> The following SAC and SPA GIS boundary datasets are the most recently available at the time of writing: SAC\_ITM\_2023\_07 and SPA\_ITM\_2023\_07.

<sup>4</sup> Wicklow County Council (2022) Wicklow County Development Plan 2022-2028. Plan as published for public display. Accessible from <https://www.wicklow.ie>

<sup>5</sup> Wicklow County Council (2010) *Wicklow Biodiversity Action Plan 2010-2015*. Plan as published for public display. Accessible from [www.wicklow.ie](http://www.wicklow.ie) Accessed: 20 June 2023.

- Wilson, F., Crushell, P. Curtis, T. & Foss, P.J. (2012) *The County Wicklow Wetland Survey II*. Report prepared for Wicklow County Council and The Heritage Council
- The Central and Regional Fisheries Board (2008) *Broad Lough. Sampling Fish for the Water Framework Directive – Transitional Waters 2008*.
- Information on the location, nature and design of the proposed development supplied by the applicant's design team
- Wicklow County Council (2022) *Wicklow County Development Plan 2022-2028*<sup>6</sup>
- Wicklow County Council (2013) *Wicklow Town - Rathnew Development Plan 2013-2019*<sup>7</sup>, as this LAP is no longer in effect, all specific objectives have been taken from the County Development Plan.
- Wicklow County Council (2010) County Wicklow Biodiversity Action Plan 2010-2015<sup>8</sup>
- The Appropriate Assessment Screening Report and the Environmental Impact Assessment report – Biodiversity chapter submitted for the adjacent Tinakilly Phase 1 residential development (Wicklow County Council Reg. Planning Ref.: 22837), which has since received Conditional Planning Permission.
  - Scott Cawley Ltd. (2022). Appropriate Assessment Screening Report for (Phase 1) Residential Development at Tinakilly, Rathnew, Co. Wicklow.
  - Scott Cawley Ltd. (2022). Environmental Impact Assessment Report – Biodiversity Chapter for (Phase 1) Residential Development at Tinakilly, Rathnew, Co. Wicklow.

### 3.5 Consultations

#### *National Parks and Wildlife Services (NPWS)*

A data request was submitted to the NPWS for records on protected and rare species within the 10km grid square in which the proposed development is located within, on the 4<sup>th</sup> April 2022, in respect of the overall scheme (i.e. Phase 1 and 2). This data was received on the 8<sup>th</sup> April 2022 and has been incorporated into the baseline and assessment of the proposed development.

#### *Development Applications Unit of the Department of Culture, Heritage and the Gaeltacht*

A consultation letter was submitted by email to the Development Applications Unit of the Department of Culture, Heritage and the Gaeltacht on 20<sup>th</sup> May 2022, in respect of the overall scheme (i.e. Phase 1 and 2). The letter included an outline description of the proposed development, and a request for any comments on the proposal. No response was been received by Scott Cawley Ltd., prior to submission of the planning application for the proposed development.

### 3.6 Baseline Surveys

This section describes the methodologies followed for the baseline ecological surveys undertaken to inform the assessment presented in this NIS.

<sup>6</sup> Wicklow County Council (2022) *Wicklow County Development Plan 2022-2028*. Plan as published for public display. Accessible from <https://www.wicklow.ie>

<sup>7</sup> Wicklow County Council (2013). *Wicklow Town - Rathnew Development Plan 2013-2019*. Plan as published for public display. Accessible from [Wicklow Town - Rathnew Development Plan 2013 - 2019](#)

<sup>8</sup> Wicklow County Council (2010). *County Wicklow Biodiversity Action Plan 2010-2015*. Plan as published for public display. Accessible from [County Wicklow Biodiversity Plan 2010-15.pdf](#)

### 3.6.1 Habitats and Flora

A habitat survey was undertaken of the proposed development site on the 12<sup>th</sup> April 2022 by Cathal O'Brien BSc MSc, Consultant Ecologist with Scott Cawley Ltd., following the methodology described in *Best Practice Guidance for Habitat Survey and Mapping*<sup>9</sup>. All habitat types were classified using the *Guide to Habitats in Ireland*<sup>10</sup>, recording the indicator species and abundance using the *DAFOR scale*<sup>11</sup> and recording any species of conservation interest. Vascular and bryophyte plant nomenclature generally follow that of *The National Vegetation Database*<sup>12</sup>, having regard to more recent taxonomic changes to species names after the *New Flora of the British Isles*<sup>13</sup> and the *British Bryological Society's Mosses and Liverworts of Britain and Ireland: A Field Guide*<sup>14</sup>. Annex I habitat types were classified after the *Interpretation manual of European Union Habitats EUR28*<sup>15</sup> with reference to the corresponding national habitat survey reports and NPWS wildlife manuals, as applicable. The nomenclature for Annex I habitats follows that of the *Interpretation manual of European Union Habitats EUR28*<sup>15</sup> with abbreviated names after those used in *The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview*<sup>16</sup>.

Surveys of the Rathnew Stream and Rossanna Lower Stream were conducted on the 9<sup>th</sup> April 2022 by Triturus Environmental Ltd (See Appendix III). The survey effort focused on both instream and riparian habitats in the vicinity of four survey sites, two of which were located on the Rathnew Stream, while the other two were located along Rossanna Lower Stream. The surveys were conducted during bright weather and base flow riverine conditions. The watercourses at each survey site were described in terms of the important aquatic habitats and species. This helped to evaluate species and habitats of ecological value in the vicinity of each site. A broad aquatic habitat assessment was conducted utilising elements of the methodology given in the Environment Agency's *River Habitat Survey in Britain and Ireland Field Survey Guidance Manual 2003*<sup>17</sup> and the Irish Heritage Council's *A Guide to Habitats in Ireland*<sup>10</sup>. All sites were assessed in terms of:

- Physical watercourse/waterbody characteristics (i.e., width, depth etc);
- Substrate type, listing substrate fractions in order of dominance (i.e., bedrock, boulder, cobble, gravel, sand, silt etc.);
- River profile in the sampling area;
- An appraisal of the macrophyte and aquatic bryophyte community at each site;
- Riparian vegetation composition;

---

<sup>9</sup> Smith, G.F., O'Donoghue, P., O'Hora, K. & Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council Church Lane, Kilkenny, Ireland.

<sup>10</sup> Fossitt, J.A. (2000) *A Guide to Habitats in Ireland*. Heritage Council, Kilkenny.

<sup>11</sup> The DAFOR scale is an ordinal or semi-quantitative scale for recording the relative abundance of plant species. The name DAFOR is an acronym for the abundance levels recorded: Dominant, Abundant, Frequent, Occasional and Rare.

<sup>12</sup> Weekes, L.C. & FitzPatrick, Ú. (2010) *The National Vegetation Database: Guidelines and Standards for the Collection and Storage of Vegetation Data in Ireland*. Version 1.0. Irish Wildlife Manuals, No. 49. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

<sup>13</sup> Stace, C. (2019) *New Flora of the British Isles. 4<sup>th</sup> Edition*. C&M Floristics.

<sup>14</sup> Atherton, I., Bosanquet, S. & Lawley, M. (2010) *Mosses and Liverworts of Britain and Ireland: A Field Guide*. Latimer Trend & Co., Plymouth.

<sup>15</sup> CEC. (Commission of the European Communities) (2013) *Interpretation manual of European Union Habitats EUR28*. European Commission, DG Environment.

<sup>16</sup> NPWS (2019). *The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview*. Unpublished NPWS report.

<sup>17</sup> Environment Agency (2003) *River Habitat Survey in Britain and Ireland Field Survey Guidance Manual – 2022 reprint*

### 3.6.2 Otter

A terrestrial fauna survey (excluding bats) was undertaken on the 12<sup>th</sup> April and 04<sup>th</sup> May 2022 by Cathal O'Brien BSc MSc, Consultant Ecologist with Scott Cawley Ltd. The presence/absence of terrestrial fauna species were surveyed through the detection of field signs such as tracks, markings, feeding signs, and droppings, as well as by direct observation. The habitats on site were assessed for signs of usage by protected/red-listed fauna species, and their potential to support these species. Surveys to check for the presence of badger setts and to record any evidence of use, were undertaken on the same dates.

Surveys to check for the presence of otter holts within the study area, and to record any evidence of use, were undertaken on the 9<sup>th</sup> April 2022 by Triturus Environmental Ltd. The presence of otter (*Lutra lutra*) at each aquatic survey site as well as upstream and downstream of the proposed development site, was determined through the recording of otter signs, if encountered incidentally during surveys. The survey broadly followed the best practice survey methodology for otter as recommended by Lenton *et al.*, (1980)<sup>18</sup>, Chanin (2003)<sup>19</sup> and Bailey & Rochford (2006)<sup>20</sup>. Notes on the age and location (ITM coordinates) were made for each otter sign recorded, in addition to the quantity and visible constituents of spraint (i.e. remains of fish, molluscs etc.).

### 3.6.3 Breeding Birds

Breeding bird surveys were undertaken on the 12<sup>th</sup> April, 04<sup>th</sup> May and 15<sup>th</sup> June 2022 by Cathal O'Brien BSc MSc, Consultant Ecologist with Scott Cawley Ltd. using a methodology adapted from the *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*<sup>21</sup>. The study area covered the lands enclosed within the proposed development boundary and the surrounding hedgerows and treelines. Lands within the study area were slowly walked in a manner allowing the surveyor to come within 50m of all habitat features. Birds were identified by sight and song, and general location and activity was recorded using the British Trust for Ornithology (BTO) species and activity codes.

### 3.6.4 Wintering Birds

Wintering bird surveys were undertaken on nine dates between the 27<sup>th</sup> January 2022 and the 28<sup>th</sup> March 2022 by Cathal O'Brien BSc MSc, Consultant Ecologist with Scott Cawley Ltd., and Lorna Gill BSc MSc, Consultant Ecologist with Scott Cawley Ltd., using a methodology based on the *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*<sup>21</sup>. The study area covered the lands within and adjacent to the red line boundary. Lands were initially surveyed visually using binoculars/scope from a vantage point(s) at the edge of the study area followed by a walkover of the area to identify birds which may not be visible from a distance (e.g. waders) and evidence of usage by wildfowl such as swans or geese (e.g. droppings). Birds were identified by sight and general location and activity were recorded using the British Trust for Ornithology (BTO) species and activity codes.

### 3.6.5 Raptor Surveys

Raptor surveys were undertaken, as part of the previously consented Tinakilly Phase 1 development (Wicklow Reg. Planning Ref. 22837), directly south of the proposed development, on the 9<sup>th</sup> April, 14<sup>th</sup> and 28<sup>th</sup> May and 25<sup>th</sup> June 2021 by Emmi Virkki BSc MSc, Senior Ecologist with Scott Cawley Ltd., using a

---

<sup>18</sup> Lenton, E.J., Chanin, P.R.F. and Jefferies, D.J. 1980. *Otter Survey of England 1977-79*. Nature Conservancy Council, London.

<sup>19</sup> Chanin, P. 2003. *Monitoring the Otter Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No. 10, English Nature, Peterborough.

<sup>20</sup> Bailey, M. and Rochford J. (2006) *Otter Survey of Ireland 2004/2005*. Irish Wildlife Manuals, No. 23. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

<sup>21</sup> Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*. RSPB: Sandy

methodologies adapted from the *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*<sup>21</sup> and *Raptors: A Field Guide for Surveys and Monitoring*<sup>22</sup>. The raptor activity within the lands were surveyed from two vantage points that allowed a view over a large area which included the proposed development site. The viewshed from each vantage point was surveyed for two hours using binoculars and scope. Raptors were identified by sight, and general location of flight lines and other activity were recorded using the British Trust for Ornithology (BTO) species and activity codes. Given the records produced from the above described survey and the lack of suitable breeding habitat within the proposed development site, these surveys were not carried out as part of the survey work carried out in 2022 to inform this report.

### 3.6.6 Aquatic Surveys

Surveys to assess habitat quality for fish species within the aquatic survey sites were undertaken on the 9<sup>th</sup> April 2022 by Triturus Environmental Ltd (See Appendix III). Fisheries habitat quality for salmonids was assessed using the Life Cycle Unit method (Kennedy, 1984<sup>23</sup>; O'Connor & Kennedy, 2002<sup>24</sup>) to map the four number riverine sites as nursery, spawning and holding habitat, by assigning quality scores to each type of habitat. Those habitats with poor quality substrata, shallow depth and a poorly defined river profile receive a higher score. Higher scores in the Life Cycle Unit method of fisheries quantification are representative of poorer value, with lower scores being more optimal despite this appearing counter intuitive.

Lamprey habitat evaluation for each survey site was undertaken using the Lamprey Habitat Quality Index (LHQI) scoring system, as devised by Macklin et al. (2018)<sup>25</sup>. The LHQI broadly follows a similar rationale as the Life Cycle Unit score for salmonids. Larval lamprey habitat quality as well as the suitability of adult spawning habitat is assessed based on the information provided in Maitland (2003)<sup>26</sup> and other relevant literature (e.g. Gardiner, 2003)<sup>27</sup>.

White-clawed crayfish (*Austropotamobius pallipes*) surveys were undertaken at the aquatic survey sites under a National Parks and Wildlife (NPWS) open licence (no. C31/2022), as prescribed by Sections 9, 23 and 34 of the Wildlife Act (1976-2021), to capture and release crayfish to their site of capture, under condition no. 6 of the licence, and following Inland Fisheries Ireland 'Clean-Check-Dry' biosecurity protocols. Hand-searching of instream refugia and sweep netting was undertaken according to Reynolds et al. (2010)<sup>28</sup>. Trapping of crayfish was not feasible given the small nature of the watercourses surveyed. An appraisal of white-clawed crayfish habitat at each site was conducted based on physical channel attributes, water chemistry and incidental records in mustelid spraint.

---

<sup>22</sup> Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. (2013) *Raptors: A Field Guide for Surveys and Monitoring*. Scottish Natural Heritage.

<sup>23</sup> Kennedy, G.J.A. (1984). *Evaluation of techniques for classifying habitats for juvenile salmon (Salmo salar L.)* Proceedings of the Atlantic Salmon trust workshop on stock enhancement. 23 pp.

<sup>24</sup> O'Connor, L. & Kennedy, R.J (2002). *A comparison of catchment-based salmon habitat survey techniques on three rivers in N. Ireland*. Fisheries Management and Ecology, 9, 149-161.

<sup>25</sup> Macklin, R., Brazier, B. & Gallagher, C. (2018). *Fisheries assessment of selected weir sites on the River Barrow, Counties Carlow & Kilkenny*. Unpublished report prepared by Triturus Environmental Services for McCarthy-Keville O' Sullivan on behalf of Waterways Ireland.

<sup>26</sup> Maitland P.S. (2003) *Ecology of river, brook and sea lamprey*. Conserving Natura 2000 Rivers Ecology Series No. 4. English Nature, Peterborough.

<sup>27</sup> Gardiner R (2003). *Identifying Lamprey. A Field Key for Sea, River and Brook Lamprey*. Conserving Natura 2000 Rivers Conservation Techniques Series No. 4. English Nature, Peterborough.

<sup>28</sup> Reynolds, J.D., O'Connor, W., O'Keefe, C. & Lynn, D. (2010) *A technical manual for monitoring white-clawed crayfish Austropotamobius pallipes in Irish lakes*. Irish Wildlife Manuals, No 45, National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.

Surveys to assess biological water quality through Q-sampling within the aquatic survey sites was undertaken on the 9<sup>th</sup> April 2022 by Triturus Environmental Ltd. All samples were taken with a standard kick sampling hand net (250mm width, 500µm mesh size) from areas of riffle/glide utilising a two-minute sample, with an additional one-minute hand search of instream substrata, as per EPA methodology (Feeley et al., 2020a)<sup>29</sup>.

### 3.6.7 Survey Limitations

The above-described surveys to inform the baseline ecology of the proposed development site have all been conducted over the course of a single year, 2022. This data is now one year old. CIEEM guidance notes that typically, ecological surveys are considered valid for a period of 12-18 months<sup>30</sup>. Given this, and considering that there has not been a significant change in management of the site since these surveys have been conducted, the results of these surveys are still considered valid and representative of the baseline of the proposed development site.

The above-described wintering bird surveys were limited to a single three-month period in early 2022. Despite being limited to a single half wintering season, a total of 9 survey visits were conducted, one a week between the end of January and the end of March, rather than the standard once a month survey. The increased frequency of these surveys was designed to capture any potential variation in use of the site over that period, to compensate for the missed portion of the early wintering season. As such this is not considered a limitation.

## 4 Description of the Proposed Development

A full description of the proposed development is included in the planning application documentation. In brief, the proposal involves:

The construction of a residential development and green spaces comprising the following:

- Construction of 352 no. residential units comprising 220 no. 2-4 bedroom houses and 132 no. 1-3 bedroom apartments
- Residential open space in the form of public/communal spaces for passive recreation (totalling approximately 10,863m<sup>2</sup>). Active open space constituting retained and developed habitats along the western and northern boundaries (totalling approximately 32,375m<sup>2</sup>).
- Provision of car parking and bicycle parking.
- All internal residential access roads and cyclist/pedestrian paths serving the proposed development.
- Proposed pedestrian connections and landscape revisions to a section of Tinakilly Avenue included in permitted application WCC Ref. 22/837.
- All vehicular and pedestrian connections between Tinakilly Park and Rathnew Village via a new section of the Rathnew Inner Relief Road.
- No further changes to development permitted under WCC Refs. 17/219 (ABP Ref. PL27.301261), 20/1000, 21/411, 22/837, or 21/1333.
- No proposed works to Tinakilly Country House Hotel (a protected structure Reference No. 25-15).

<sup>29</sup> Feeley, H. B., Bradley, C., Free, G., Kennedy, B., Little, R., McDonnell, N., ... & Boyle, S. O. (2020a). A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007–2018. *Scientific Data*, 7(1), 1-9.

<sup>30</sup> CIEEM (2019) Advice Note on the Lifespan of Ecological Reports & Surveys. April 2019. Chartered Institute of Ecology and Environmental Management, Winchester, England



- All associated site development works, services provision, infrastructural and drainage works, provision of substations, bin stores, bicycle stores, car parking, public lighting, landscaping, open space, and boundary treatment works.

The proposed development includes the completion of the Rathnew Inner Relief Road (RIRR), connecting the R750 and R761 regional roads, and the provision of 3no. new junctions on this road. It is also proposed under this application to restrict vehicular access along Tinakilly Avenue between the R750 and the RIRR, with vehicular access to the Tinakilly Country House hotel instead provided from the RIRR.

A series of SuDS measures have been incorporated into the design of the proposed development, including the provision of 3,349m<sup>3</sup> of constructed wetlands (surface water storage basins), attenuation tank (380m<sup>3</sup>), permeable paving, swales, filter drains, water butts and oversized pipes.

In line with good practice effective SuDS measures for surface water have been included in the construction design of the proposed development. However, it must be noted that these are included in the design, not for the purposes of avoiding or reducing any potential harmful effects to any European sites but are required for new developments under the under the objectives of the Greater Dublin Strategic Drainage Study and Wicklow County Development Plan 2022-2028<sup>6</sup> and in line with good construction practice. It is an objective of the Greater Dublin Strategic Drainage Study, and Wicklow County Development Plan 2022-2028, to incorporate Sustainable Urban Drainage Systems (SuDS) within new developments (see Appendix I). The SuDS features associated with the design of the proposed development are not included within the design to avoid or reduce any potential harmful effects to any European sites.

As part of the above vehicular access to the site, it is important to note, that the proposed northern access road is proposed to cross the Rathnew Stream in the north-west corner of the proposed development site. This will likely require instream works within Rathnew Stream, the potential impacts of which are highlighted in Section 6.2, below.

The project duration is estimated at approximately 48 months.

The main characteristics of the operational phase of the proposed development that have the potential for likely significant effects on European sites and their QI/SCIs include; the presence and operation of the new Rathnew Inner Relief Road and routine maintenance works.

## 5 Overview of the Receiving Environment

### 5.1 European Sites

The proposed development does not overlap with any European sites (see Figure 1 and Figure 2, below). The nearest European sites to the proposed development are The Murrough Wetlands SAC (002249) and The Murrough SPA (004186); both located approximately 440m to the east. The above European sites are also hydrologically connected to the proposed development site, approximately 700m downstream, via the Rathnew Stream (EPA Code: 10R02) and its tributary Rossanna Lower Stream (EPA Code: 10R19).

There are five SACs and two SPAs that are potentially hydrologically connected to the proposed development via surface water pathways: The Murrough Wetlands SAC, Wicklow Reef SAC, Magherabeg Dunes SAC, Buckrone-y-Brittis Dunes and Fen SAC, Wicklow Mountains SAC, The Murrough SPA and Wicklow Head SPA.

There is one SPA, The Murrough SPA, designated for wintering SCI species that are known to forage and/or roost at inland sites in Ireland, and one SPA, Wicklow Mountains SPA, located approximately 12.4km west of the proposed development, designated for birds of prey (peregrine *Falco peregrinus* and merlin *Falco columbarius*) that are known to not hold exclusive home ranges<sup>22</sup>.

In addition, Wicklow Mountains SAC is designated for mobile QI species (otter *Lutra lutra*) known to utilise a wide range of freshwater and marine habitats on the east coast.

The European sites present in the vicinity of the proposed development are listed in Table 1, along with their Qualifying Interests and proximity to the proposed development, and shown on Figure 1, with Figure 2 showing the proximity of The Murrough Wetlands SAC and The Murrough SPA.

**Table 1 European sites in the vicinity of the proposed development**

Site name and code	Distance from Proposed Development	Reasons for designation <sup>31</sup>
<b>Special Areas of Conservation (SACs)</b>		
<b>The Murrough Wetlands SAC [00002249]</b>	The proposed development lies approximately 440m west of this European site.	1210 Annual Vegetation of drift lines 1220 Perennial Vegetation of Stony Banks 1330 Atlantic Slat meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) 1410 Mediterranean Salt Meadows ( <i>Juncetalia maritimi</i> ) 7210 Calcareous Fens with <i>Cladium mariscus</i> and species of the Caricion davallianae* 7230 Alkaline Fens  <i>S.I. No. 622/2017 - European Union Habitats (The Murrough Wetlands Special Area of Conservation 002249) Regulations 2017</i> NPWS (2021) Conservation Objectives: The Murrough Wetlands SAC 002249. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage. <sup>32</sup>
<b>Wicklow Reef SAC [002274]</b>	The proposed development lies approximately 5.3km from this European site.	1170 Reefs  <i>S.I. No. 104/2016 - European Union Habitats (Wicklow Reef Special Area of Conservation 002274) Regulations 2016.</i> NPWS (2013) Conservation Objectives: Wicklow Reef SAC 002274. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
<b>Deputy's Pass Nature Reserve SAC [000717]</b>	The proposed development lies approximately 7.1km from this European site.	91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles  <i>S.I. No. 192/2016 - European Union Habitats (Deputy's Pass Nature Reserve Special Area of Conservation 000717) Regulations 2016.</i> NPWS (2021) Conservation Objectives: Deputy's Pass Nature Reserve SAC 000717. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.
<b>Magherabeg Dunes SAC [001766]</b>	The proposed development lies approximately 7.5km from	1210 Annual vegetation of drift lines 2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes)

<sup>31</sup> "Qualifying Interests" for SACs and "Special Conservation Interests" for SPAs based on relevant Statutory Instruments for each SAC and SPA, or NPWS Conservation Objectives downloaded from www.npws.ie in May 2023. Data on NHA/pNHA sites from the site synopsis documents published by the NPWS (where available).

Priority Annex I habitat types are denoted with an "\*" and are habitat types which are in danger of disappearance at a European level – from the definition of "priority natural habitat types" in Article 1(d) of the Habitats Directive

<sup>32</sup> The versions of the conservation objectives documents referenced in this table are the most recent published versions at the time of writing



Site name and code	Distance from Proposed Development	Reasons for designation <sup>31</sup>
	this European site.	<p>2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)*            2150 Atlantic decalcified fixed dunes (Calluno-Uliceatea)*            7220 Petrifying springs with tufa formation (<i>Cratoneurion</i>)*</p> <p><i>S.I. No. 611/2019 - European Union Habitats (Magherabeg Dunes Special Area of Conservation 001766) Regulations 2019.</i></p> <p>NPWS (2017) Conservation Objectives: Magherabeg Dunes SAC 001766. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.</p>
<p><b>Vale of Clara (Rathdrum Wood) SAC [000733]</b></p>	<p>The proposed development lies approximately 9.8km from this European site.</p>	<p>91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles</p> <p><i>S.I. No. 212/2019 - European Union Habitats (Vale of Clara (Rathdrum Wood) Special Area of Conservation 000733) Regulations 2019.</i></p> <p>NPWS (2021) Conservation Objectives: Vale of Clara (Rathdrum Wood) SAC 000733. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.</p>
<p><b>Buckroneys-Brittias Dunes And Fen SAC [000729]</b></p>	<p>The proposed development lies approximately 10.8km from this European site.</p>	<p>1210 Annual vegetation of drift lines            1220 Perennial vegetation of stony banks            1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>)            2110 Embryonic shifting dunes            2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes)            2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)*            2150 Atlantic decalcified fixed dunes (Calluno-Uliceatea)*            2170 Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>)            2190 Humid dune slacks            7230 Alkaline fens</p> <p><i>S.I. No. 67/2022 - European Union Habitats (Buckroneys-Brittias Dunes and Fen Special Area of Conservation 000729) Regulations 2022.</i></p> <p>NPWS (2017) Conservation Objectives: Buckroneys-Brittias Dunes and Fen SAC 000729. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.</p>
<p><b>Wicklow Mountains SAC [002122]</b></p>	<p>The proposed development lies approximately 12.4km from this European site.</p>	<p>3110 Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>)            3130 Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i>            3160 Natural dystrophic lakes and ponds            4010 Northern Atlantic wet heaths with <i>Erica tetralix</i>            4030 European dry heaths            4060 Alpine and Boreal heaths            6130 Calaminarian grasslands of the <i>Violetalia calaminariae</i>            6230 Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)*            7130 Blanket bogs (* if active bog)            8110 Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>)</p>

Site name and code	Distance from Proposed Development	Reasons for designation <sup>31</sup>
		<p>8210 Calcareous rocky slopes with chasmophytic vegetation            8220 Siliceous rocky slopes with chasmophytic vegetation            91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles            1355 Otter <i>Lutra lutra</i></p> <p>NPWS (2017) <i>Conservation Objectives: Wicklow Mountains SAC 002122</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.</p>
<b>Carriggower Bog SAC [000716]</b>	The proposed development lies approximately 13km from this European site.	<p>7140 Transition mires and quaking bogs</p> <p>S.I. No. 293/2018 - European Union Habitats (Carriggower Bog Special Area of Conservation 000716) Regulations 2018</p> <p>NPWS (2019) <i>Conservation Objectives: Carriggower Bog SAC 000716</i>. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.</p>
<b>Glen of the Downs SAC [000719]</b>	The proposed development lies approximately 14.6km from this European site.	<p>91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles</p> <p>S.I. No. 526/2019 - European Union Habitats (Glen of the Downs Special Area of Conservation 000719) Regulations 2019</p> <p>NPWS (2020) <i>Conservation Objectives: Glen of the Downs SAC 000719</i>. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.</p>
<b>Special Protection Areas (SPAs)</b>		
<b>The Murrough SPA [004186]</b>	The proposed development lies approximately 440m west of this European site.	<p>A001 Red-throated Diver <i>Gavia stellata</i>            A043 Greylag Goose <i>Anser anser</i>            A046 Light-bellied Brent Goose <i>Branta bernicla hrota</i>            A050 Wigeon <i>Anas penelope</i>            A052 Teal <i>Anas crecca</i>            A179 Black-headed Gull <i>Chroicocephalus ridibundus</i>            A184 Herring Gull <i>Larus argentatus</i>            A195 Little Tern <i>Sterna albifrons</i>            A999 Wetland and Waterbirds</p> <p>S.I. No. 298/2011 - European Communities (Conservation of Wild Birds (The Murrough Special Protection Area 004186)) Regulations 2011.</p> <p>NPWS (2022) Conservation objectives for The Murrough SPA [004186]. First Order Site-specific Conservation Objectives Version 1.0. Department of Housing, Local Government and Heritage.</p>
<b>Wicklow Head SPA [004127]</b>	The proposed development lies approximately 3.9km from this European site.	<p>A188 Kittiwake <i>Rissa tridactyla</i></p> <p>NPWS (2022) Conservation objectives for Wicklow Head SPA [004127]. First Order Site-specific Conservation Objectives Version 1.0. Department of Housing, Local Government and Heritage.</p>

Site name and code	Distance from Proposed Development	Reasons for designation <sup>31</sup>
<b>Wicklow Mountains SPA [004040]</b>	The proposed development lies approximately 14.2km from this European site.	A098 Merlin <i>Falco columbarius</i> A103 Peregrine <i>Falco peregrinus</i>  S.I. No. 586/2012 - European Communities (Conservation of Wild Birds (Wicklow Mountains Special Protection Area 004040)) Regulations 2012.  NPWS (2022) Conservation objectives for Wicklow Mountains SPA [004040]. First Order Site-specific Conservation Objectives Version 1.0. Department of Housing, Local Government and Heritage

RECEIVED: 14/08/2023

RECEIVED: 14/08/2023

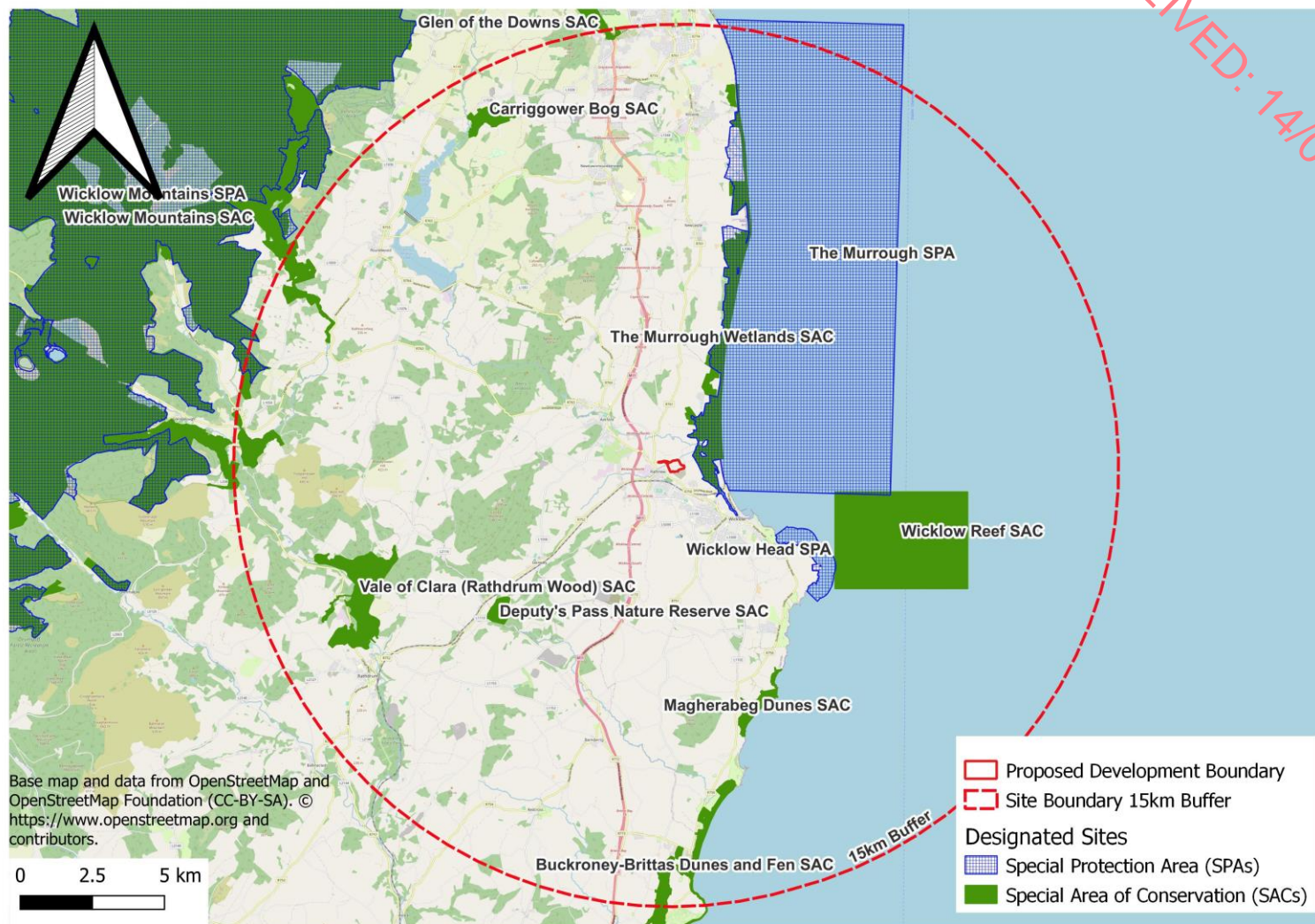
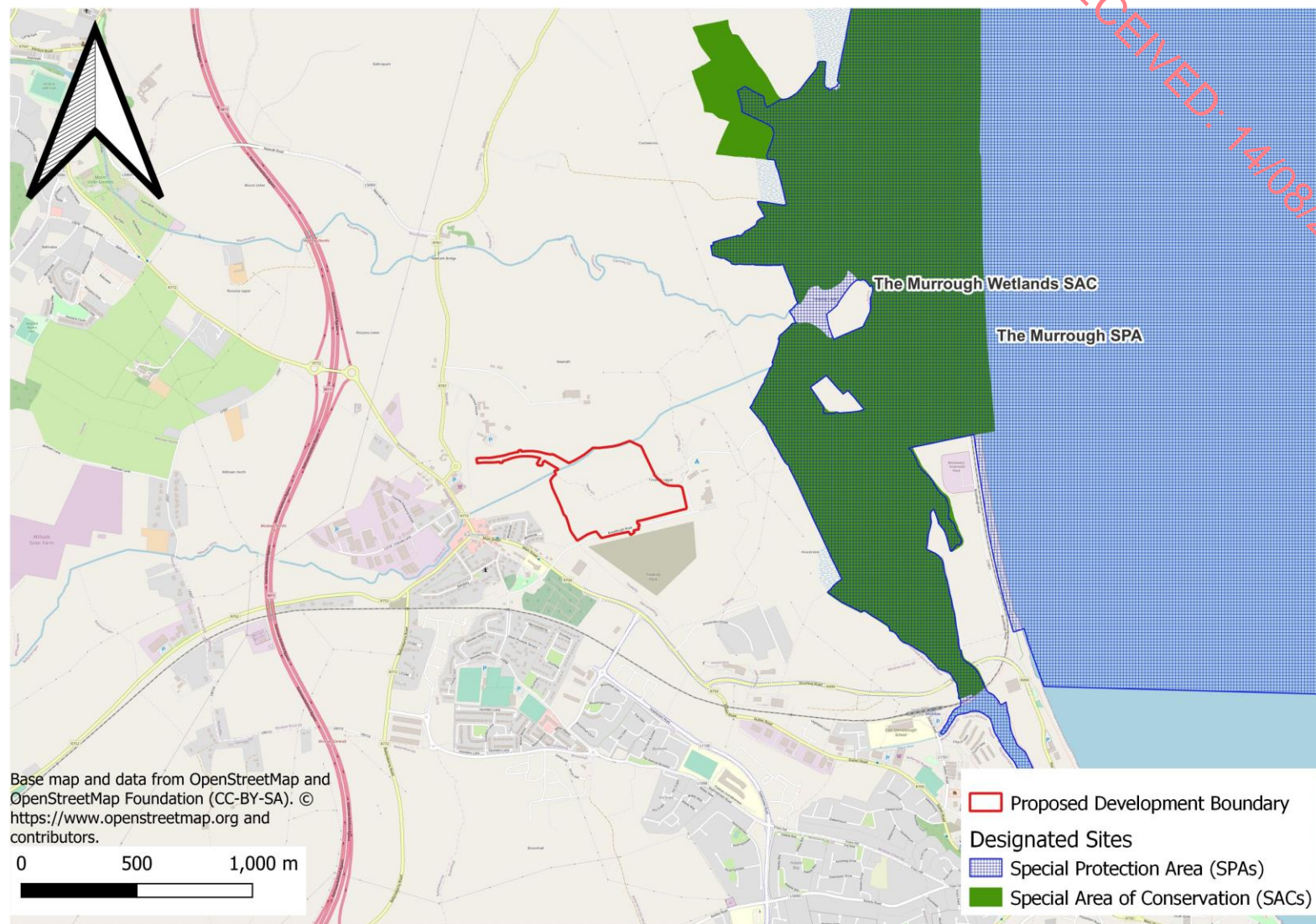


Figure 1 European sites within the vicinity of the proposed development site



RECEIVED: 14/08/2023



**Figure 2 European sites in close proximity to the proposed development site**

### 5.1.1 Habitats

The proposed development site encompasses two adjacent arable crop (BC1) fields, separated by a central mostly east-west treeline (WL2) which changes into a southeast-northwest hedgerow (WL1) and eventually joins the north-western corner of the site in a patch of scrub (WS1). The Rathnew Stream (FW2) forms the northern boundary of the site, while its tributary the Rossanna Lower Stream (FW2) forms the eastern boundary along with treelines and hedgerows.

The southern field is bounded to the east by a hedgerow, beyond which is located Tinakilly House and the associated outbuildings, a number of residential properties and the Knockrobin Glamping Campground. The north is bounded by the central treeline and the south the mature treelined Tinakilly House entrance avenue. The west is bounded by the Rossanna Lower Stream and a treeline, with some willow and bramble scrub developing along this treeline. The north-eastern portion of the field is comprised of wet grassland (GS4). A small area of scrub is located within the centre of this field.

The northern field is bounded to the south by the central treeline, the west by a hedgerow which grades into scrub at the north-western corner, the east by an agricultural fenceline and the north by the Rathnew Stream and associated treeline/hedgerow. There is an area of scrub and grassy verge (GS2) in the centre of this field in the area of an old quarry, with portions of grassy verge also present in the north-east and north-west corners.

The following habitat types assigned using the Heritage Council classification system<sup>10</sup> were identified within or immediately adjacent to the proposed development site during surveys carried out in April and July 2022:

- Arable Crops (BC1)
- Dry meadows and grassy verges (GS2)
- Wet Grassland (GS4)
- Scrub (WS1)
- Hedgerow (WL1)
- Treelines (WL2)
- Lowland depositing Watercourses (FW2)
- Drainage ditches (FW4)

The locations of these habitats are presented in **Error! Reference source not found.**

No EU Habitats Directive Annex I habitats were recorded within the proposed development site.



**Figure 3 Habitats recorded within the proposed development site**

#### Arable crops (BC1)

The dominant habitat within the proposed development site was arable crops (BC1). This is a species poor habitat with barley crop (*Hordeum vulgare*) dominating the sward (at time of survey), forb species comprised, groundsel *Senecio vulgaris*, nipplewort *Lapsana communis*, field-speedwell *Veronica persica*, common chickweed *Stellaria media*, red dead nettle *Lamium purpurea*, field spurrey *Spergula arvensis* and shephard's purse *Capsella-bursa pastoris*, as well as the grass annual meadow grass *Poa annua*. This habitat is heavily managed through regular harvesting, ploughing and application of fertilisers, as such species diversity is relatively low.

#### Amenity Grassland (GA2)

This habitat occurs along the northern and southern edge of the Tinakilly House Avenue, in the southern extent of the proposed development. This habitat is largely dominated by grass species such as perennial ryegrass *Lolium perenne*, Yorkshire fog *Holcus lanatus* and sweet vernal grass *Anthoxanthum odoratum*, but is also interspersed with some forb species including daisy *Bellis perennis*, creeping buttercup *Ranunculus repens* and red clover *Trifolium pratense*. This habitat is overall species poor due to reseeding and intensive management as such is considered to be of Local Low value.

#### Dry meadows and grassy verges (GS2)

This habitat occurs predominantly adjacent to the west of the proposed development, in the northeast along the Rathnew Stream and beside an area of scrub in the northern arable field. This habitat is largely dominated by grass species such as false-oat grass *Arrhenatherum elatius* and Yorkshire-fog but is interspersed with forb species such as bush vetch *Vicia sepium*, ribwort plantain *Plantago lanceolata*, red clover, creeping buttercup, germander speedwell *Veronica chamaedrys* and meadow vetchling *Lathyrus*



*pratensis*. This habitat forms a mosaic with wet grassland (GS4) where species of such wet ground including great willowherb *Epilobium hirsutum* and meadowsweet *Filipendula ulmaria* begin to overlap.

This habitat is overall species poor due a lack of management and nutrient run-off from the fertilised arable fields which allows grasses to dominate and in patches where encroachment of vegetation such as bramble, common nettle *Urtica dioica*, field horsetail and gorse.

The non-native invasive species Himalayan balsalm *Impatiens glandulifera* has been recorded within the grassland vegetation bordering the Rathnew Stream.

#### Wet grassland (GS4)

Wet grassland is restricted to a small area in the west of the proposed development site located between willow scrub (WS1) and dry meadows and grassy verges habitat (GS2). This area of habitat contains a variable range of species including reed canary grass *Phalaris arundinacea*, common reed grass *Phragmites australis* and marsh foxtail *Alopecurus geniculatus* while forb species include flag iris *Iris pseudacorus*, marsh-bedstraw *Galium palustris*, soft rush *Juncus effusus*, sharp-flowered rush *Juncus acutiflorus*, compact rush *Juncus conglomeratus*, water horsetail *Equisetum fluviatile*, marsh woundwort *Stachys palustris* and great willowherb.

#### Scrub (WS1)

The scrub habitat occurs along the western edge of the proposed development site, in discrete areas within these fields and along the Rathnew Stream along the northern boundary and the confluence with the Rosanna Stream in the northwest of the proposed development. Largely dominated by Willow *Salix* spp., including *Salix cinerea* subsp. *oleifolia*, with immature alder *Alnus glutinosa*, wild cherry *Prunus avium*, bramble *Rubus fruticosus* agg. and gorse *Ulex europaeus* the scrub habitat overlaps with a lowland stream, namely the Rosanna Stream and drainage ditch (FW4) along the western boundary and also encroaches onto the adjacent dry meadow and grassy verge (GS2) habitat. The herb layer in the scrub habitat along the watercourses comprises creeping buttercup, hemlock water-dropwort *Oenanthe crocata* and meadowsweet while in spring ramsons and lesser celandine are common. The Third Schedule non-native invasive species Himalayan balsalm *Impatiens glandulifera* occurs between gaps in the shrub layer in the north-east of the site along the Rathnew Stream (see

).

Portions of this habitat, along the Rathnew Stream have the capacity to transition into riparian woodland (WN5) in the long term, but are currently still considered to be in the scrub phase of this transition due to the lack of mature trees of any species. These habitats are connected further upstream and to other linear features to the north and west, to Broadlough downstream and also provides shelter to the Rathnew stream providing important commuting, resting and foraging habitat.

Willow and wild cherry dominate a small discrete area of scrub within the northern arable field (BC1), while a patch of scrub in the southern arable field is comprised of hawthorn *Crataegus monogyna* and elder *Sambucus nigra*.

The non-native invasive species Himalayan balsalm *Impatiens glandulifera* has been recorded within the scrub vegetation bordering the Rathnew Stream.

#### Hedgerows (WL1)

Small sections of linear features in the proposed development site comprise hedgerows, namely in the centre and to the east. The feature to the west of the central treeline (WL2) contains blackthorn, hawthorn, bramble and gorse while the feature to the east contains oak *Quercus* sp., beech *Fagus sylvatica*, sycamore *Acer pseudoplatanus*, bramble and elder. This hedgerow partly forms the boundary of a neighbouring private house which is dominated by planted cherry laurel *Prunus laurocerasus* and yew *Taxus baccata*. The ground vegetation generally comprises lesser celandine *Ficaria verna*, lords and ladies *Arum maculatum*, cleavers *Galium aparine*, hogweed *Heracleum sphondylium* and creeping buttercup *Ranunculus repens*.

#### Treelines (WL2)



The treelines within the proposed development are situated along the southern boundary and form part of the western boundary as well as the linear feature in the centre of the site which divides the two arable fields. There are two treelines with predominantly large and very mature specimen trees in the centre and along the south, and another semi-mature treeline in the west of the proposed development. Treelines within the proposed development are comprised of such species as ash *Fraxinus excelsior*, wild cherry, beech, Spanish chestnut *Castanea sativa*, Oak, sycamore Douglas fir *Pseudotsuga mensiezii*, horse-chestnut *Aesculus hippocastanum* and elder. The understorey layer of the treelines contains such shrubby species as bramble, hawthorn, blackthorn *Prunus spinosa*, elder, dog rose *Rosa canina* agg. and holly *Ilex aquifolium*. The ground layer of the treelines include species like lesser celandine, lords and ladies, cleavers, ground ivy *Glechoma hederifolia*, common hogweed, common ivy *Hedera helix*, nettles *Urtica dioica*, ramsons *Allium ursinum* and soft shield-fern *Polystichum setiferum*. These are all common species from the wider landscape. The non-native invasive species Spanish Bluebell, *Hyacinthoides hispanica* or its hybrid was recorded in the eastern sections of the central and southern treelines.

#### Depositing/ lowland rivers (FW2)

This habitat comprises the Rathnew Stream and Rosanna Lower Stream which bound the north and west of the proposed development site, respectively. The Rathnew Stream is relatively species poor with the dominant species instream being hemlock water-dropwort. The banks comprise riparian scrub (WS1) (see above) with the dominant species consisting of rusty willow *Salix cinerea* subsp. *oleifolia* and alder while pedunculate oak *Quercus robur* and wych elm *Ulmus glabra* occur on the opposite bank. The understorey is dominated by great willowherb, common nettle, pendulous sedge *Carex pendula*, ramsons and hedge bindweed *Calystegia sepium*.

This habitat is part of the aquatic corridor linking downstream to Broadlough and the Irish Sea with the hydrological network upstream and to other linear features such as treelines and hedgerows in the wider landscape.

#### Drainage ditches (FW4)

Drainage ditches (FW4) habitat occurs along the southwest of the proposed development. The feature runs alongside a hedgerow (WL1) where it then joins the Rosanna Lower Stream which is a tributary of the Rathnew Stream. The drainage ditch was dry at the time of the habitat surveys and is species poor. The drainage ditch is comprised of cleavers, hogweed, common nipplewort and creeping buttercup, all species typically associated with adjacent grassland habitats.

### 5.1.2 Flora Species

#### 5.1.2.1 Protected Flora

The desktop study did not return any records for Annex II flora species within approximately 10km of the proposed development.

Field surveys undertaken at the proposed development site in April and July 2022 did not record any Annex II flora species within or adjacent to the proposed development site.

#### 5.1.2.2 Non-native Invasive Flora

With regards to records for non-native invasive species within approximately 2km of the proposed development, the NBDC database search returned records for the following five non-native invasive flora: *Gunnera tinctoria*, *Impatiens glandulifera*, *Reynoutria japonica*<sup>33</sup> and *Rhododendron ponticum* which are all listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended) and also the recently delisted *Elodea canadensis*. There is one record for *E. canadensis* and *I. glandulifera* each, from alongside the River Vartry, approximately 1km north-west of the proposed

<sup>33</sup> Previously known as *Fallopia japonica*.

development site, dating from 2009. There are two records of *G. tinctoria* from 2009 and 2021, and one record for *R. ponticum* from 2021, also from along the River Vartry, approximately 1km away. The most recent record of the six records on the database for *R. japonica* is from 2021. The nearest of these records is located approximately 1km north-west of the proposed development, adjacent to the above records alongside the River Vartry.

Field surveys undertaken at the proposed development site in April and July 2022 recorded two species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended), including Himalayan balsam *Impatiens glandulifera* along the Rathnew Stream on north eastern boundary of the proposed development site and Spanish bluebell *Hyacinthoides hispanica* or its hybrid *Hyacinthoides x hybridum*, within the eastern portion of the central and southern treelines. The locations of these records are shown in below.



**Figure 4 Non-native Invasive Species listed on the Third Schedule recorded within the proposed development site**

### 5.1.3 Fauna Species

#### 5.1.3.1 Mammals

##### Otter

Otter *Lutra lutra*, and their breeding and resting places, are protected under the Wildlife Acts. Otter are also listed on Annex II and Annex IV of the EU Habitats Directive where they are afforded strict protection. They are regarded to be of “Least Concern” in terms of conservation status in Ireland (Marnell et al.,

2019)<sup>34</sup>. The NBDC database search returned four records for otter within approximately 2km of the proposed development site. The nearest record is from Broadlough, approximately 760m east of the proposed development. All the other records are also from Broadlough. There are additional records for otter in the wider area of Co. Wicklow, noted from the National Otter Survey reports from 1980-1981<sup>35</sup>, 2004-2005<sup>36</sup> and 2010-2011<sup>37</sup>. The nearest of these records is from River Vartry, approximately 9.3km north-west and dates back to 1980. Additionally, Scott Cawley Ltd., ecologists anecdotally recorded otter in River Vartry, approximately 2.1km north-west of the proposed development in September 2021. The NPWS database holds no records for otter in the 10km grid squares, T29 and T39, in which the proposed development is located in.

Otter evidence was recorded during the aquatic surveys undertaken by Triturus Environmental Ltd. (Appendix III) for the proposed development, in four locations along the Rathnew Stream, including three spraint sites and a couch site. These are shown in **Error! Reference source not found.**, below.

Further to the evidence of otter within the proposed development site, the local otter populations are considered to be of international importance, as they have the potential to be hydrologically linked to the Wicklow Mountains SAC QI populations due to its proximity to the site and considering that otter territories can reach up to 21km along hydrological pathways (Ó' Neill *et al.*, 2009)<sup>38</sup>. Wicklow Mountains SAC is located within a different sub-catchment (e.g. Avonmore\_SC\_010) to the proposed development (Vatry\_SC\_010), however considering the distance between some watercourses within the Avonmore and Vartry sub-catchments are not large, i.e. starting from approximately 200m, and the fact that otter do not strictly travel within watercourses when commuting, although they never move far from one<sup>39</sup>, there is potential for otter crossing from one sub-catchment to another.

---

<sup>34</sup> Marnell, F., Looney, D. & Lawton, C. (2019) Ireland Red List No. 12: Terrestrial Mammals. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.

<sup>35</sup> Chapman, P.J. and Chapman, L.L. 1982. Otter Survey of Ireland 1980-81. The Vincent Wildlife Trust, London.

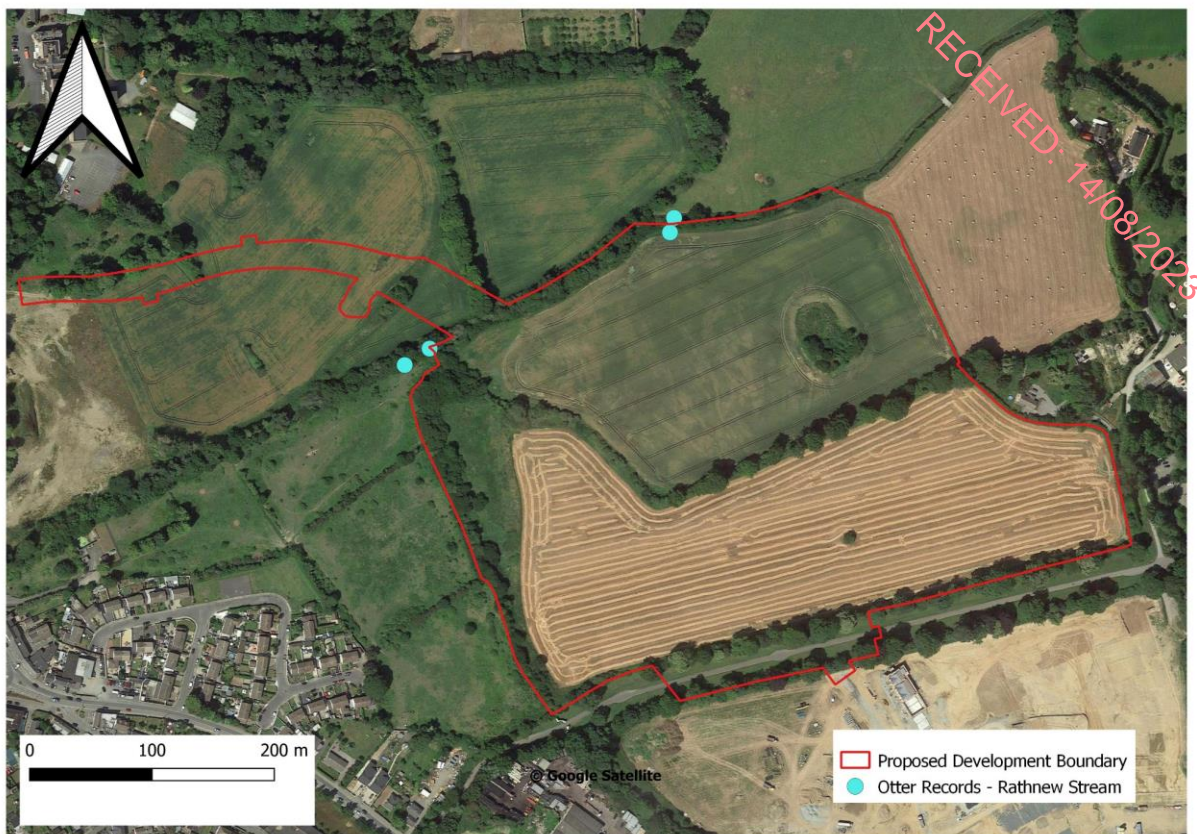
<sup>36</sup> Bailey, M. and Rochford J. (2006) Otter Survey of Ireland 2004/2005. Irish Wildlife Manuals, No. 23. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

<sup>37</sup> Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & Montgomery, W.I. (2013). *National Otter Survey of Ireland 2010/12*. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

<sup>38</sup> Ó'Neill, L., Veldhuizen, T., de Jongh, A., Rochford, J. (2009) *Ranging behaviour and socio-biology of Eurasian otters (Lutra lutra) on lowland mesotrophic river systems*. European Journal of Wildlife Research. 55:363-370.

<sup>39</sup> Hayden, T. and Harrington, R. (2000) *Exploring Irish Mammals*. Department of Arts, Heritage, Gaeltacht and the Islands, Dublin, Ireland.





**Figure 5 Otter Evidence recorded within the Proposed Development Site**

#### Marine Mammals

The NBDC database holds records for two marine mammal species grey seal *Halichoerus grypus* (Annex II and V species of the EU Habitats Directive) and harbour porpoise *Phocoena phocoena* (Annex II and Annex IV species of the EU Habitats Directive) within approximately 2km of the proposed development. There is one record for grey seal approximately 1km north-east and one record for harbour porpoise, located approximately 2.5km south-east, from 2014 and 2017, respectively.

Additionally the NPWS database holds one record for harbour seal *Phoca vitulina* (Annex II and V species of the EU Habitats Directive) from the same 10km grid square, T29, in which the proposed development is partially located; the Irish Whale and Dolphin Group holds records for bottlenose dolphin *Tursiops truncatus* (Annex II and Annex IV species of the EU Habitats Directive), harbour porpoise from the Irish Sea along the coastline running past the proposed development site from 2021; additionally Scott Cawley Senior Ecologist Emmi Virkii BSc MSc, recorded a grey seal at the southern end of Broadlough approximately 1km east of the proposed development site on the 26<sup>th</sup> January 2021. A rare Sowerby's beaked whale *Mesoplodon bidens* (Annex IV species of the EU Habitats Directive) was also recorded at Wicklow Harbour in 2020 (NBDC record beyond 2km of the proposed development). The NPWS database holds no records for marine mammals within the 10km grid squares, T29 and T39, in which the proposed development is located. The grey seal and the harbour seal are of "Least Concern", whereas the Red list status for the other cetaceans have not been evaluated (Marnell *et al.*, 2019)<sup>34</sup>.

Grey seal and harbour porpoise are the QI species of the Lambay Island SAC and Rockabill to Dalkey Island SAC, and are located approximately 54km and approximately 28km north of the proposed development, respectively. Considering the distance to the Lambay Island SAC and the habit of seals travelling long distances in search of food, up to approximately 450km has been recorded for grey seal<sup>39</sup>, seals seen at Broadlough may form part of the SAC populations. With regard to harbour porpoise, the size of the home ranges are not known<sup>39</sup><sup>Error! Bookmark not defined.</sup> but considering the Rockabill to Dalkey Island SAC is relatively close in terms of distances at sea, individual harbour porpoises encountered along the coastline within approximately 2km of the proposed development, are likely to form part of the SAC population.

Other EU Habitats Directive Annex-listed cetaceans<sup>40</sup>, such as bottle-nosed dolphins, are also regular visitors to the east coast of Ireland. The bottle-nosed dolphin is the QI species of the Lower River Shannon SAC, located approximately 160km west of the proposed development on the south-west coast of Ireland. Considering the distance to the Lower River Shannon SAC around the coasts of Ireland is even longer, any bottle-nosed dolphins recorded on the east coast are unlikely to form part of this SAC population. There are no designated sites for other cetacean species, such as the Sowerby's beaked whale, encountered in Irish waters.

There is no suitable habitat within the proposed development for marine mammals, however, it is hydrologically connected via the surface water network to the coastal waters they inhabit.

#### 5.1.3.2 Birds

All wild birds, and their nests and eggs, are protected under the Wildlife Acts. Some bird species are also listed on Annex I of the EU Birds Directive. The NBDC database holds records for 51 bird species which are known to occur within approximately 2km of the proposed development site. Of these species, 29 are special conservation interest (SCI) species of European sites, nine are listed under Annex I of the Birds Directive, five others are Red-listed (of High Conservation Concern) and 13 others Amber-listed (of Medium Conservation Concern) on the Birds of Conservation Concern of Ireland 2020-2026<sup>41</sup> list. Species listed under the EU Birds Directive or in the Birds of Conservation Concern of Ireland 2020-2026 are presented in a table in Appendix II.

##### Breeding Birds

The NBDC database returned records for five SCI species (black-headed gull *Chroicocephalus ridibundus*, dunlin *Calidris alpina*, European herring gull *Larus argentatus*, great cormorant *Phalacrocorax carbo* and lesser black-backed gull *Larus fuscus*) for which there are European sites designated in the vicinity of the proposed development. Of these species, four (black-headed gull, European herring gull, great cormorant and lesser black-backed gull) are Amber-listed (of Medium Conservation Concern) and one (dunlin) is Red-listed (of High Conservation Concern) in the Birds of Conservation Concern in Ireland<sup>41</sup>.

There is no suitable breeding habitat within the proposed development site for these species, as their preferred breeding habitats include cliffs (European herring gull and great cormorant), lakes (black-headed gull, European herring gull, great cormorant and lesser black-backed gull), offshore islands (European herring gull, great cormorant and lesser black-backed gull), vast reedbeds or marshy areas (black-headed gull and great cormorant) and machair (dunlin<sup>42</sup>). Most of these species, with the exception of dunlin, tend to breed in colonies. The majority of dunlin records in coastal areas are recorded during winter months as they are found in a variety of coastal and marshy habitats during migration, however occasionally a few individuals do not migrate back north for the breeding season.

A single kingfisher *Alcedo atthis* was recorded on the 16<sup>th</sup> June 2022, during field surveys, flying upstream along the Rathnew Stream on the northern boundary of the proposed development site. The closest European site designated for the protection of Kingfisher is the River Boyne and Blackwater SPA located approximately 76km north of the proposed development site. Kingfisher populations within close proximity of the proposed development are not deemed to be SCI species associated with the River Boyne and River Blackwater SPA, given the significant distance between the proposed development site and the designated site.

A single cormorant was recorded foraging in Rathnew Stream approximately 100m downstream of the proposed development site boundary. The closest European site designated for the protection of

---

<sup>40</sup> Irish Whale and Dolphin Group recent sightings. Available at: <https://iwdg.ie/> Accessed on: 20 June 2023.

<sup>41</sup> Gilbert, G., Stanbury, A. & Lewis, L. (2021) Birds of Conservation Concern in Ireland 4: 2020-2026. Irish Birds 43:1-22.

<sup>42</sup> BirdWatchIreland (2022) *Dunlin*. Available at: [www.birdwatchireland.ie](http://www.birdwatchireland.ie) Accessed on: 20 June 2023.

cormorant is Ireland's Eye SPA, located approximately 44km north of the proposed development. Studies have shown that the cormorant is able to forage up to 20-25km from its wintering roosts or breeding colonies. Most foraging trips are confined to within 10km of the colony (Gremillet 1997<sup>43</sup>, BirdLife International 2000<sup>44</sup>), but trips up to a 35 km radius have been recorded (Gremillet 1997<sup>43</sup>). Considering the distance between the proposed development site and Ireland's Eye SPA and the known foraging ranges of this species, cormorant populations in close proximity of the proposed development are not deemed to be SCI species associated with the Ireland's Eye SPA.

No other SCI species were recorded as part of the breeding bird surveys undertaken at the proposed development site.

#### Wintering birds

The NBDC database returned records for 16 SCI species for which there are European sites designated for their wintering populations. Of these species, nine are Amber-listed (of Medium Conservation Concern) and six are Red-listed (of High Conservation Concern) in the Birds of Conservation Concern in Ireland<sup>Error! Bookmark not defined.</sup>. At the time of the wintering bird surveys, there was no suitable habitat within the proposed development site for wintering SCI species which utilise inland sites for foraging, such as Eurasian curlew *Numenius arquata*, geese or gulls.

A total of 19 species were recorded during wintering bird surveys carried out at the proposed development site, these included nine SCI species (black-headed gull, Common gull *Larus canus*, cormorant, great black-backed gull *Larus marinus*, grey heron *Ardea cinerea*, herring gull, lesser black-backed gull, little egret *Egretta garzetta*, mallard *Anas platyrhynchos*), as well as an additional Red-listed species (Kestrel) and two Amber-listed species (red-kite and stock dove). No Annex I bird species were recorded during the wintering bird surveys. Of the above listed species, only cormorant was recorded utilising habitat in proximity to the proposed development site, recorded foraging in the Rathnew Stream. While the remaining records consisted of birds flying over the proposed development site. The results of the wintering bird surveys as they pertain to SCI species are shown in **Error! Reference source not found.** below, for clarity records of herring gull are shown in **Error! Reference source not found.**, the majority of wintering bird records from across the survey period constituted species flying over the proposed development site.

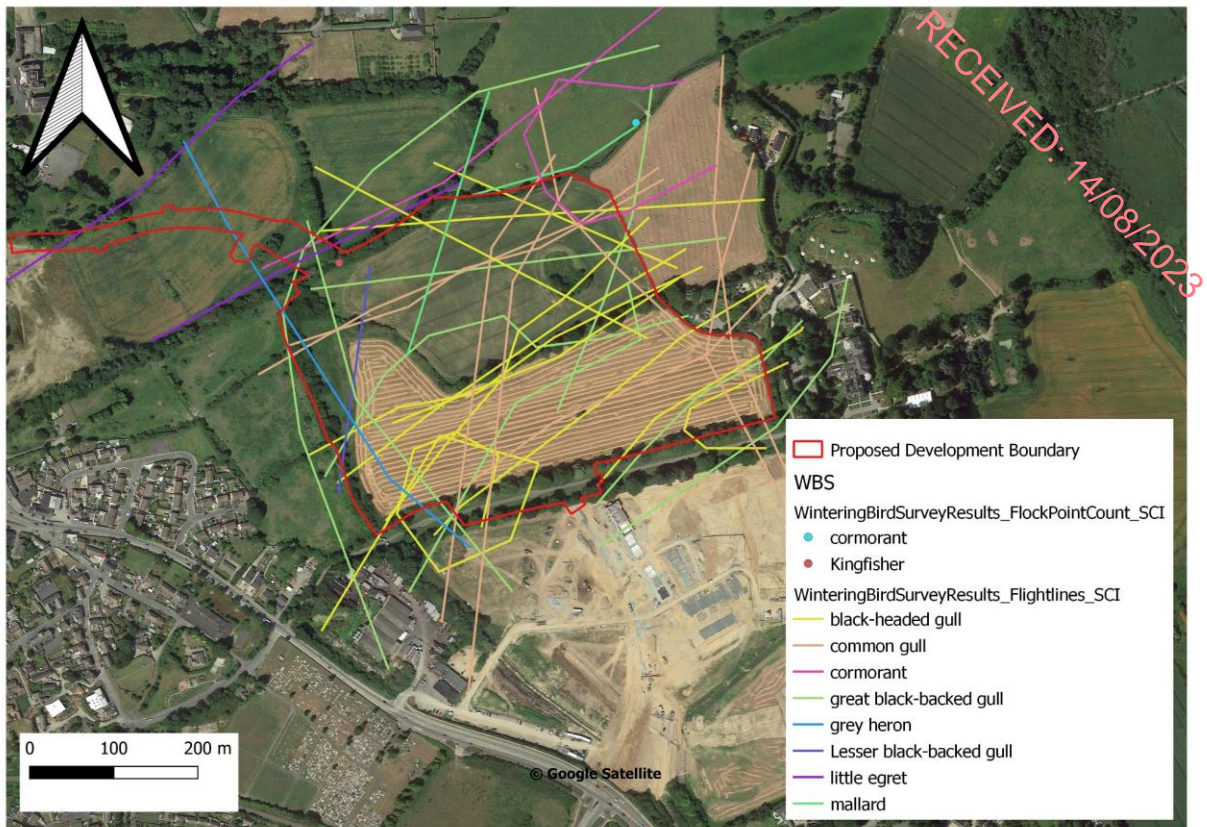
In addition, the wetland habitats at the adjacent Broadlough are used by wintering SCI bird populations of The Murrough SPA, as well as by wintering SCI populations moving along the east coast at the beginning and end of migration season.

---

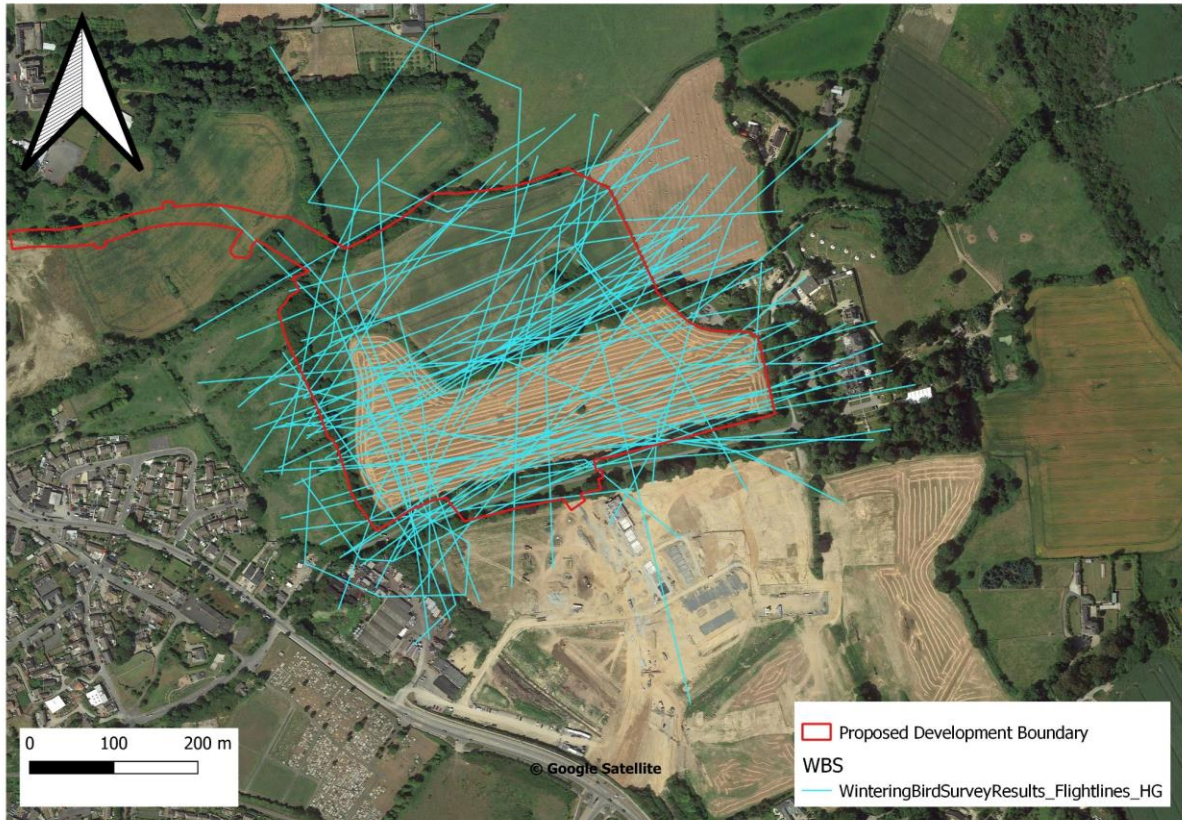
<sup>43</sup> Gremillet, D. 1997. Catch per unit effort, foraging efficiency, and parental investment in breeding great cormorants (*Phalacrocorax carbo carbo*). ICES Journal of Marine Science 54(4): 635-644.

<sup>44</sup> BirdLife International. 2000. The Development of Boundary Selection Criteria for the Extension of Breeding Seabird Special Protection Areas into the Marine Environment. OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic. Vlissingen (Flushing).





**Figure 6 Wintering bird survey results for the proposed development**



**Figure 7 Wintering bird Survey Results for the proposed development - herring gull**

### Raptor Surveys

During the raptor surveys carried out on the adjacent consented Phase 1 Tinakilly development (Wicklow Reg. Planning Ref. 22837) in 2021, a single hen harrier *Circus cyaneus* and a peregrine *Falco peregrinus* were recorded in the vicinity of Broadlough. Both of the species are listed under the Annex I of the EU Birds Directive. Hen harrier is also Amber-listed (of Medium Conservation Concern) in the Birds of Conservation Concern in Ireland<sup>41</sup> due to decline in their population across the country.

The hen harrier (female) was recorded hunting on the reedbeds and saltmarsh on the 26<sup>th</sup> March 2021, whereas the peregrine was recorded flying towards north along the Broadlough on the 14<sup>th</sup> May 2021. The nearest designated site for hen harrier is the Slieve Bloom Mountains SPA, and for peregrine, the Wicklow Mountains SPA, located approximately 90.2km and approximately 14.4km west of the proposed development, respectively. Both of these sites are designated for their breeding populations.

Considering that hen harrier typically spend their non-breeding season (broadly defined as mid-August to mid-March) at lowland sites below 100m<sup>22</sup> and mid-March/late-March to May is the time when a pair is establishing a territory<sup>45</sup>, the individual female recorded adjacent to the site on the 26<sup>th</sup> March, was either late returning to its breeding grounds or perhaps was a non-breeder, e.g. a sub-adult. Although generally males and females have home ranges of up to 7.3km<sup>2</sup> and 3.6km<sup>2</sup><sup>22</sup>, respectively, the record is from towards the end of non-breeding season when birds are returning to their breeding home ranges, and therefore it is possible that it may form part of the SAC population and just had not returned to the SAC yet. Hen harrier has not been recorded breeding in the Wicklow Mountains (the nearest upland habitats for breeding hen harrier from the proposed development) during national breeding hen harrier surveys<sup>45</sup>.

With regard to the peregrine, the species was recorded during the breeding season. Although the species is not considered to hold exclusive home ranges, most hunting is carried out within 2km of the nest site, with occasional bird venturing as far as 6km from the nest to hunt<sup>22</sup>. Considering this and the distance to the Wicklow Mountains SPA, it is considered unlikely that the peregrine recorded at Broadlough forms part of the SPA SCI breeding populations.

No other SCI raptor species were recorded. Although, the site and the surrounding lands might be used by foraging and/or commuting SCI raptor species, there is no suitable breeding habitat (e.g. upland habitats such as heath (hen harrier) or cliffs (peregrine and merlin)<sup>2222</sup>) within the proposed development site.

#### 5.1.3.3 Fish

The NBDC database returned no records for fish species listed under the EU Habitats Directive within approximately 2km of the proposed development. However, river lamprey *Lampetra fluviatilis* (Annex II and V species of the EU Habitats Directive) was recorded in Broadlough during Inland Fisheries Ireland (IFI) surveys in 2010<sup>46</sup>. The River Vartry which discharges to Broadlough is designated under the European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. 293) as it is considered capable of supporting Annex II and V species, Atlantic salmon *Salmo salar*. Based on this and that the river has been listed on the North Atlantic Salmon Conservation Organization (NASCO) Irish Salmon Rivers Database<sup>47</sup> and Angling Ireland website<sup>48</sup> for Atlantic salmon, it can be considered that these species are present within the river, and Broadlough, in the absence of other records.

---

<sup>45</sup> Ruddock, M., Mee, A., Lusby, J., Nagle, A., O'Neill, S. & O'Toole, L. (2016). *The 2015 National Survey of Breeding Hen Harrier in Ireland*. Irish Wildlife Manuals, No. 93. National Parks and Wildlife Service, Department of the Arts, Heritage and the Gaeltacht, Ireland

<sup>46</sup> Inland Fisheries Ireland (2010) Sampling Fish for the Water Framework Directive: Transitional Waters 2010. Broad Lough. Available at: [www.wfdfish.ie](http://www.wfdfish.ie) Accessed on: 20 June 2023.

<sup>47</sup> NASCO Database of Irish Salmon Rivers. Available at: <https://nasco.int/rivers-database/> and <https://nasco.int/wp-content/uploads/2020/02/CNL0545.pdf> Accessed on: 20 June 2023.

<sup>48</sup> Angling Ireland. Information on River Vartry fishing available at: [www.fishingireland.info](http://www.fishingireland.info) Accessed on: 20 June 2023.



The proposed development site is not hydrologically connected to any European site designated for EU Habitats Directive fish species. The nearest designated site for *S. salar* and *L. fluviatilis*, or other Annex II and/or Annex V fish species (e.g. brook lamprey *Lampetra planeri*, sea lamprey *Petromyzon marinus* and twaite shad *Alosa fallax*) is the Slaney River Valley SAC, located approximately 31.5km south-west of the proposed development site and in the separate Derreen sub-catchment (Derreen\_SC\_010) which forms part of the Slaney and Wexford Harbour catchment.

Fisheries data was not available for the Rathnew Stream or Rossanna Lower Stream. However, Atlantic salmon, brown trout and sea trout *Salmo trutta*, European eel and lamprey are known from the wider Varty\_SC\_010 sub-catchment (Kelly *et al.*, 2015)<sup>49</sup>.

Aquatic survey results from the proposed development carried out by Triturus Environmental Ltd. (Appendix III) concluded that the Rathnew Stream was considered as being of high fisheries value given it had excellent nursery for salmonid species, due to the presence of abundant well-oxygenated glide and riffle habitat, good quality salmonid spawning habitat throughout and good quality salmonid holding habitat locally; very good brook lamprey nursery with both spawning areas and soft sediment ammocoete burial areas present; and good value for European eel given undercut banks with pool and high shading.

Salmonid remains were recorded within the otter spraint (droppings) recorded along the Rathnew Stream, while a live Atlantic salmon fry was recorded in the Q-sampling effort, confirming the presence of this Annex II species within the Stream.

Triturus Environmental Ltd., concluded that the Rosanna Lower Stream was not considered suitable for salmonid species, however, during winter flows some salmonids may enter the stream from the adjoining Rathnew Stream, which was considered a significant salmonid watercourse. The Rosanna Lower Stream was considered to have good potential for brook lamprey with abundant ammocoete burial habitat present and moderate quality spawning areas featuring medium and fine gravels; and low value to European eel which may occur locally in pools.

#### 5.1.3.4 Invertebrates

##### Marsh Fritillary

The NBDC database returned no records for Annex II butterfly species, marsh fritillary *Euphydryas aurinia* within approximately 2km of the proposed development.

There is a small area of potential suitable foraging habitat (damp grassland with wildflowers, GS4) for the species within the north-west corner of the site. However, none of the larval foodplants *Succisa pratensis* were recorded within the footprint of the proposed development. Considering this, the proposed development site is considered unsuitable for marsh fritillary.

Evidence of the species or suitable supporting species were not recorded within the proposed development site during the surveys carried out in April and July 2022.

##### Freshwater Pearl Mussel

The NBDC database returned no records for freshwater pearl mussel *Margaritifera margaritifera* (Annex II and V species of the EU Habitats Directive) within approximately 2km of the proposed development, however there are previous records of the species in the Varty sub-catchment, although the current status is unknown<sup>50</sup>. The nearest designated site for the species is the Slaney River Valley SAC, located approximately 31.5km south-west of the proposed development site and within a different catchment.

---

<sup>49</sup> Kelly, F.L., Connor, L., Matson, R., Feeney, R., Morrissey, E., Coyne, J. & Rocks, K. (2015). Sampling Fish for the Water Framework Directive, Rivers 2014. Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24, Ireland.

<sup>50</sup> <https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=2fae3c393baa4b79b7dfb1e3c19f3fab> Accessed on: 20 June 2023.

The Rathnew Stream and Rossanna Stream Lower form the northern and western boundaries of the proposed development site, respectively. Given the lack of suitable salmonid habitat recorded within Rossanna Stream Lower, by Triturus Environmental Ltd. during field surveys on the 9<sup>th</sup> April 2022, the presence of freshwater pearl mussel within this stream is considered extremely unlikely given the species' reliance on salmonids for its larval life stages. The Rathnew Stream however, was recorded to have good to excellent quality habitat for salmonids and other fish species and achieved Q4 (good status) biological water quality, therefore the Rathnew stream is considered suitable to support freshwater pearl mussel, although the likelihood of them establishing within this watercourse given their sedentary nature, is extremely low.

#### Other Invertebrates

The desk study returned no records for other invertebrate species, such as white-clawed crayfish *Austropotamobius pallipes* (Annex II and V species of the EU Habitats Directive), within approximately 2km of the proposed development.

No white-clawed crayfish were recorded during the aquatic surveys carried out by Triturus Environmental on the 9<sup>th</sup> April 2022. The Rossanna Lower Stream was found to have no suitable habitat for this species while the Rathnew Stream had areas of potentially suitable habitat along its banks, although no evidence was recorded.

#### **5.1.4 Hydrology**

The watercourses in the vicinity of the proposed residential development are small to medium-sized lowland depositing watercourses (FW2; Fossitt, 2000). The site is located within the Vartry (Vartry\_SC\_010) sub-catchment, which is contained within the Ovoca-Vartry catchment, and Rathnew Stream and Wicklow sub-basins which drain into Broadlough and from there to the Irish Sea.

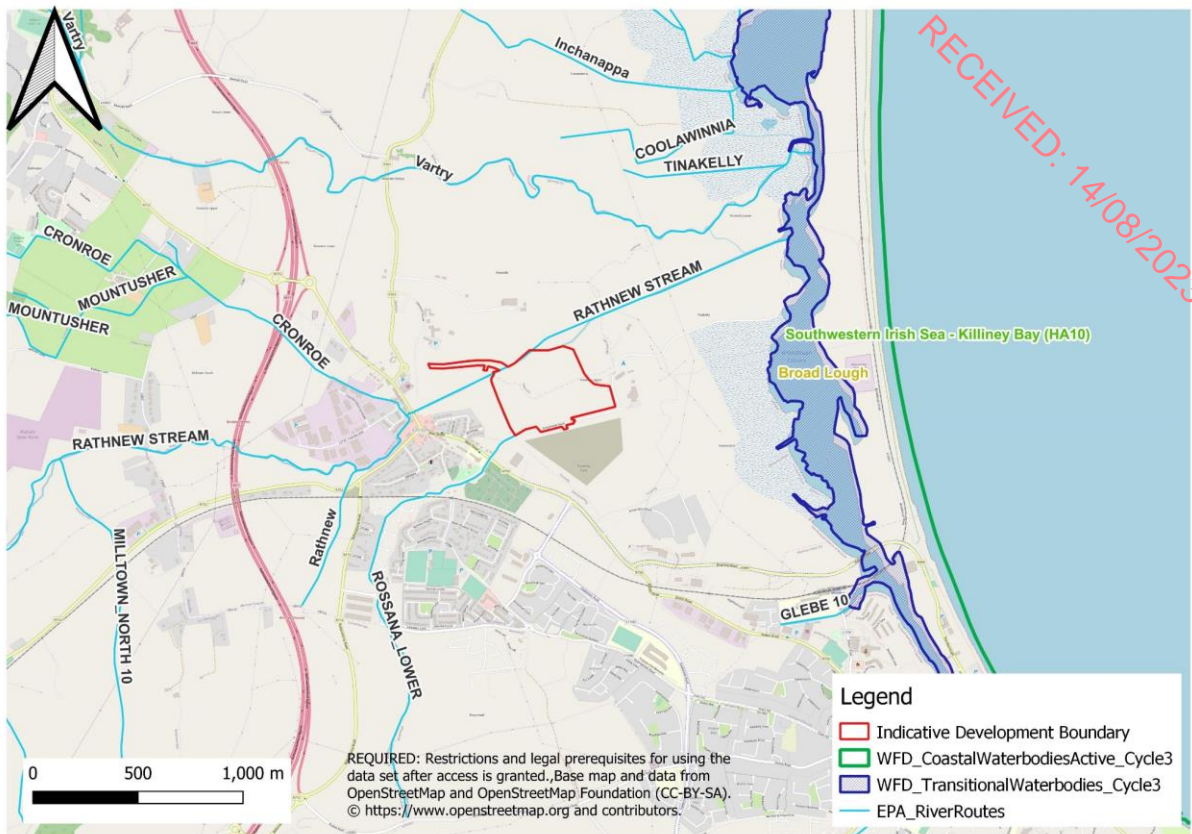
The proposed development is bordered to the west by the Rossanna Lower Stream and to the north by the Rathnew Stream within the Vartry\_SC\_010 sub-catchment. The Rathnew Stream flows from the proposed development site approximately 700m metres west where it enters The Murrough Wetlands SAC [002249] and the Murrough SPA [004186].

The Rossanna Lower Stream converges with the Rathnew Stream in the north-west corner of the proposed development site. The Rathnew Stream flows from here along the northern boundary of the proposed development site flowing approximately 1.15km to the east where it discharges into Broadlough Estuary (IE\_EA\_130\_0100), see **Error! Reference source not found.**, below.

There is a single EPA biological monitoring station on the Rathnew Stream, approximately 400m upstream of the proposed development site. This site (station RS10R020600 in Rathnew) achieved Q4 (good status) in 2020. There is no biological water quality monitoring station on the Rossanna Lower Stream.

The Rathnew Stream and Rossanna Stream (both part of the Rathnew Stream\_010 river waterbody) was ranked of 'Good' WFD status and considered 'Not at risk' in the 2016-2021 period (EPA, 2021).

Aquatic surveys carried out by Triturus Environmental Ltd. included Q sampling efforts at two locations on each of the Rathnew and Rosanna Lower Streams (Appendix III). The surveys carried out on the Rosanna Lower Stream concluded that biological water quality (Q-sampling), was calculated as Q3-4 (moderate status), with no macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, recorded. The surveys carried out on the Rathnew Stream concluded that biological water quality (Q-sampling), was calculated tentatively (due to deep glide habitat) as Q4 (good status), with no macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, recorded.



**Figure 8 Hydrological Connectivity of the Proposed Development site**

### 5.1.5 Hydrogeology

Geological Survey of Ireland (GSI) data indicates that the site is underlain by a Locally Important Bedrock Aquifer (LI), which is moderately productive only in local zones. The site is located in an area of ‘Low’ to ‘High’ groundwater vulnerability.

The Groundwater Body (GWB) underlying the site is the Wicklow GWB, which is currently classified by the EPA as having ‘Good Status’. Its risk status is currently under review. The Wicklow GWB overlaps with four European sites that are designated for groundwater dependent terrestrial habitats, i.e. The Murrough Wetlands SAC, Magherabeg Dunes SAC, Buckronev-Brittass Dunes and Fen SAC and Knocksink Wood SAC, which are located approximately 250m east, 7.1km and 7.2km south-east, and 23.2km north-west of the proposed development site, respectively.

Based on information published by GSI on the Wicklow GWB<sup>51</sup>, ‘the groundwater discharges directly to the sea along the coast. The GWB will also be discharged to the overlying streams and rivers as baseflow. The proportion of river flow that is baseflow will vary throughout the area.’

### 5.1.6 Soils & Geology

GSI data indicates that the site is underlain by soils classed as Glaciofluvial sands and gravels, Alluvium and Tills (diamictons). These are described as limestone sand and gravels (Carboniferous), Alluvium undifferentiated and sandstone and shale till (Cambrian/Precambrian) with a matrix of Irish Sea basin origin, respectively.

<sup>51</sup> [https://secure.dcae.gov.ie/GSI\\_DOWNLOAD/Groundwater/Reports/GWB/WicklowGWB.pdf](https://secure.dcae.gov.ie/GSI_DOWNLOAD/Groundwater/Reports/GWB/WicklowGWB.pdf)

The bedrock beneath the site comprises of Maulin Formation, which comprises of dark blue-grey slate, phyllite and schist. The Maulin Formation is of Ordovician origin and is described as “penetratively cleaved dark blue grey slates and phyllites which are commonly striped with pale siltstone laminae. Bands of garnetiferous quartzite that are 20m thick occur in the granite aureole. there are also thick lenses of orthoquartzite”.

## 6 Potential Impacts, Zone of Influence and Identifying European Sites at Risk of Effects

Based on the baseline and receiving ecological environment and the nature and characteristics of the proposed development the following potential impacts have been identified:

- Habitat loss and fragmentation;
- Habitat degradation as a result of hydrological impacts;
- Habitat degradation as a result of hydrogeological impacts;
- Habitat degradation as a result of introducing/spreading non-native invasive species;
- Disturbance and displacement impacts; and
- Mortality risk.

### 6.1 Habitat loss and fragmentation

The proposed development does not overlap with the boundary of any European site. Therefore, there are no European sites at risk of direct habitat loss impacts.

As the proposed development does not traverse any European sites there is no potential for direct habitat fragmentation to occur.

There was no suitable habitat for foraging and/or roosting SCI bird species within the proposed development site during the winter surveys carried out onsite, with no significant usage of the site by any of the species recorded flying over, and therefore the proposed development site is unlikely support significant populations of any fauna species linked with the SCI populations of any European site(s) and there is no potential for direct habitat loss/fragmentation impacts on these species to occur. However, there is potential for adjacent lands to provide suitable supporting habitat relied upon by wintering SCI species potentially linked with the SCI populations of any European site(s), this is dealt with in Section 6.5, below.

There is suitable habitat for QI species, such as otter, with evidence of use of the site recorded along the northern site boundary along the Rathnew Stream. Therefore, the proposed development site has the potential to support populations of QI fauna species potentially linked with QI populations of the Wicklow Mountains SAC and there is potential for habitat loss/fragmentation impacts on this species to occur through the loss of resting places and foraging and commuting habitat.

The proposed crossing of the Rathnew Stream has the potential to cause habitat severance/ barrier effects to otter along the Rathnew Stream.

As the proposed development has the potential to result in loss and/or fragmentation of *ex-situ* habitat utilised by a QI species, namely otter potentially associated with a European site, there is potential for cumulative effects to occur in this regard.

### 6.2 Habitat degradation as a result of hydrological impacts

The construction of the proposed development and the northern access road which is proposed to cross the Rathnew Stream has the potential to result in the release of contaminated surface water runoff and/or an accidental spillage or a pollution event. This has the potential to affect water quality in the receiving aquatic environment. Such a pollution event may include: the release of sediment into receiving waters and the subsequent increase in mobilised suspended solids; the leakage and/or spillage of cementitious

materials into receiving waters; and, the accidental spillage and/or leakage of contaminants into receiving waters.

Therefore, there is the possibility of the proposed development undermining the conservation objectives of any of the qualifying interests or special conservation interests of the European sites in, or associated with Rathnew Stream and Broadlough (The Murrough Wetlands SAC and The Murrough SPA), as a result of the release of contaminated surface water runoff and/or an accidental spillage or pollution event discharges during the construction of the proposed development and the northern access road over the Rathnew Stream.

Given the significant level of hydrological dispersion which would occur between any contamination or spillage event within the proposed development site and the Irish Sea, is it not considered likely that any contamination or spillage event would significantly effect water quality within the Irish Sea, and as such is unlikely to affect any QI/SCI of any European site within the Irish Sea.

Surface water run-off and discharges from the proposed development site will be attenuated onsite prior to discharge to the watercourses, Rathnew Stream and Rosanna Lower Stream, which form the northern and western boundaries. Foul waters from the proposed development will be discharged to Wicklow Wastewater Treatment Plant (WwTP) for treatment, via the existing foul water drainage network, prior to discharge into the Irish Sea. Therefore, the Zone of Influence (Zoi) of potential effects on water quality from the proposed development could extend to Broadlough and the Irish Sea.

#### *Surface Water*

The proposed development comprises five principal catchments for the collection and disposal of stormwater runoff from impermeable areas:

- Catchment A of 5.93ha, representing the majority of the site to the east of the proposed Rathnew Inner Relief Road.
- Catchment B of 3.16ha, including the southernmost section of the Rathnew Inner Relief Road proposed under this application, as well as areas to the west and east of this.
- Catchment C of 1.3ha, comprising the north-east corner of the development site.
- Catchment D of 0.44ha, representing the central section of the Rathnew Inner Relief Road proposed under this application.
- Catchment E of 0.62ha, representing the Rathnew inner relief road on the northern side of Rathnew Stream.

Areas outside these defined catchments shall not be significantly developed and shall maintain their current natural drainage patterns. Full details of the proposed surface water drainage can be found CS Consulting drawings A034-CSC-ZZ-XX-DR-C-0005/006, A034-CSC-ZZ-XX-DR-C-0036, A034-CSC-ZZ-XX-DR-C-0037/0038.

Stormwater runoff from the proposed development's five defined catchment areas shall drain to internal swales and stormwater detention basins (ponds). These SuDS features allow some direct infiltration of stormwater, and also provide attenuation storage to cater for extreme rainfall events. All stormwater from the development's drainage network shall discharge to the existing Rathnew Stream and Rossana Lower stream, at the development site's northern and western boundaries, respectively. Flow control devices shall restrict the discharge rate to the greenfield runoff rates established for each catchment. The greenfield runoff rate at the development site has been established as 6.56 l/s/ha. A total attenuation storage volume of 3,369m<sup>3</sup> is required for the development site, and a total attenuation storage volume of 3,453m<sup>3</sup> is provided.

Wicklow County Council requires that all developments adhere to their policy of implementing Sustainable Drainage Systems (SuDS). The proposed SuDS features within the subject development shall consist of:

- Low water usage sanitary appliances to reduce the volume of potable water required for use within buildings



- Installation of online water butts to capture rainwater from roof areas and to store this for local use, landscaping and maintenance purposes, further reducing reliance on the potable water network.
- Permeable paving for car-parking bays to allow rainwater to dissipate into the ground, mimicking the current natural arrangement.
- Swales to capture the rainwater from the internal network and permit infiltration.
- Attenuation tank with permeability to allow for infiltration.
- Holding the majority of stormwater collected during extreme storm events in suitably designed detention basins and wetlands, which also allow for infiltration.

### *Foul Water*

All effluent generated at the site will be conveyed to the Wicklow Wastewater Treatment Plant via proposed foul drainage network. The P.E. for the proposed development is calculated to be 950 P.E.

Foul water, comprising sewage and industrial effluent (and some surface water run-off), is treated at Wicklow WwTP prior to discharge to the Irish Sea. The most recent information from Uisce Éireann indicates that the plant is operating within its capacity of 34,000 P.E. (Irish Water, 2020<sup>52</sup>), with a current operational loading of approximately 18,762 P.E. Wicklow WWTP operates under a discharge licence from the EPA (D0012-01) and must comply with the licence conditions.

It is also an objective of the Greater Dublin Strategic Drainage Study (DDS 2005), and all development plans under the Wicklow County Development Plan 2022-2028<sup>6</sup> to include Sustainable Urban Drainage Systems (SuDS) within new developments. The relevant development plan also has protective policies/objectives in place to protect water quality in the receiving freshwater and marine environments, and to implement the Water Framework Directive in achieving good water quality status for Irish Sea.

Considering the above, particularly the current unpolluted status of the Irish Sea, that the Wicklow WwTP has the capacity to treat the additional loading, and that foul water discharges from the proposed development would equate to a very small percentage of the overall discharge volumes sent to Wicklow WwTP for treatment, it is concluded that the proposed development will not impact on the overall water quality status of Irish Sea.

Therefore, there is no possibility of the proposed development undermining the conservation objectives of any of the Qualifying Interests or Special Conservation Interests of the European sites in, or associated with, Irish Sea as a result of foul water discharges.

### *In Combination*

There is potential for “in combination” effects on water quality in the Broad Lough TWB and Irish Sea from any other projects carried out within the functional areas of the Wicklow County Development Plan 2022-2028<sup>6</sup>, or any other land use plans which could influence conditions in Irish Sea via rivers and other surface water features.

The Eastern & Midland Regional Assembly, Regional Spatial & Economic Strategy 2019-2031<sup>53</sup> includes a range of policy objectives relevant to the protection of European sites and the protection of water quality in Irish Sea, to which the relevant planning authorities must have regard to in the preparation and adoption of their development plans (included in Appendix I).

---

<sup>52</sup> Irish Water (2020) Annual Environmental Report 2020 Wicklow D0012-01. [https://www.water.ie/uuid/51cce695-6b1d-43d4-9ccc-30a09b186f1c/d0012-01\\_2020\\_aer\\_1.pdf](https://www.water.ie/uuid/51cce695-6b1d-43d4-9ccc-30a09b186f1c/d0012-01_2020_aer_1.pdf) (Accessed 20/06/2023)

<sup>53</sup> Eastern & Midland Regional Assembly (2019) *Regional Spatial & Economic Strategy 2019-2030*

The planning authority for the proposed development is Wicklow County Council (WCC). Plans and developments within Wicklow County must comply with the following policy objectives of the Wicklow County Development Plan 2022 – 2028<sup>6</sup> relevant to the protection of European sites and the protection of water quality in Irish Sea:

CPO13.1

To ensure and support the implementation of the EU Groundwater Directive and the EU Water Framework Directive and associated River Basin and Sub-Basin Management Plans and Blue Dot Catchment Programme, to ensure the protection, improvement and sustainable use of all waters in the County, including rivers, lakes, ground water, coastal and estuarine waters, and to restrict development likely to lead to a deterioration in water quality. The Council will also have cognisance of, where relevant, the EU's Common Implementation Strategy Guidance Document No. 20 and 36 which provide guidance on exemptions to the environmental objectives of the Water Framework Directive.

CPO 13.5

To ensure compliance with and to implement the provisions of the Nitrates Directive in so far as it falls within the remit of the Council to do so.

CPO 13.6

To encourage and promote the use of catchment-sensitive farming practices, in order to meet Water Framework Directive targets and comply with the River Basin Management Plan.

CPO 13.16

Permission will be considered for private wastewater treatment plants for single rural houses where:

- the specific ground conditions have been shown to be suitable for the construction of a treatment plant and any associated percolation area;
- the system will not give rise to unacceptable adverse impacts on ground waters / aquifers and the type of treatment proposed has been drawn up in accordance with the appropriate groundwater protection response set out in the Wicklow Groundwater Protection Scheme (2003);
- the proposed method of treatment and disposal complies with Wicklow County Council's Policy for Wastewater Treatment & Disposal Systems for Single Houses ( $PE \leq 10$ ) and the Environmental Protection Agency "Waste Water Treatment Manuals"; and
- in all cases the protection of ground and surface water quality shall remain the overriding priority and proposals must definitively demonstrate that the proposed development will not have an adverse impact on water quality standards and requirements set out in EU and national legislation and guidance documents

CPO 13.21

Ensure the implementation of Sustainable Urban Drainage Systems (SUDS) in accordance with the Wicklow County Council SuDS Policy to ensure surface water runoff is managed for maximum benefit. In particular to require proposed developments to meet the design criteria of each of the four pillars of SuDS design; Water Quality, Water Quantity, Amenity and Biodiversity.

CPO 17.1

To protect, sustainably manage and enhance the natural heritage, biodiversity, geological heritage, landscape and environment of County Wicklow in recognition of its importance for nature conservation and biodiversity and as a non-renewable resource.

CPO17.2

Ensure the protection of ecosystems and ecosystem services by integrating full consideration of these into all decision making.

#### CPO17.3

To support and promote the implementation of the County Wicklow Heritage Plan and the County Wicklow Biodiversity Action Plan.

#### CPO 17.4

To contribute, as appropriate, towards the protection of designated ecological sites including Special Areas of Conservation (SACs) and Special Protection Areas (SPAs); Wildlife Sites (including proposed Natural Heritage Areas); Salmonid Waters; Flora Protection Order sites; Wildfowl Sanctuaries (see S.I. 192 of 1979); Freshwater Pearl Mussel catchments; and Tree Preservation Orders (TPOs). To contribute towards compliance with relevant EU Environmental Directives and applicable National Legislation, Policies, Plans and Guidelines, including but not limited to the following and any updated/superseding documents:

- EU Directives, including the Habitats Directive (92/43/EEC, as amended)<sup>6</sup>, the Birds Directive (2009/147/EC)<sup>7</sup>, the Environmental Liability Directive (2004/35/EC)<sup>8</sup>, the Environmental Impact Assessment Directive (2011/92/EU, as amended), the Water Framework Directive (2000/60/EC), EU Groundwater Directive (2006/118/EC) and the Strategic Environmental Assessment Directive (2001/42/EC); EU 'Guidance on integrating ecosystems and their services into decision-making' (European Commission 2019)
- National legislation, including the Wildlife Acts 1976 and 2010 (as amended)<sup>9</sup>, European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, the Wildlife (Amendment) Act 2000, the European Union (Water Policy) Regulations 2003 (as amended), the Planning and Development Act 2000 (as amended), the European Communities (Birds and Natural Habitats) Regulations 2011 (SI No. 477 of 2011), the European Communities (Environmental Liability) Regulations 2008 (as amended)<sup>10</sup> and the Flora Protection order 2015.
- National policy guidelines (including any clarifying circulars or superseding versions of same), including 'Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment' (2018), 'Guidance for Consent Authorities regarding Sub-Threshold Development' (2003), 'Tree Preservation Guidelines', 'Landscape and Landscape Assessment' (draft 2000), 'Appropriate Assessment Guidance' (2010);
- Catchment and water resource management plans, including the National River Basin Management Plan 2018-2021 (including any superseding versions of same),
- Biodiversity plans and guidelines, including National Biodiversity Action Plan 2017-2021 (including any superseding versions of same) and the County Wicklow Biodiversity Action Plan;
- Ireland's Environment – An Integrated Assessment 2020 (EPA), including any superseding versions of same), and to make provision where appropriate to address the report's goals and challenges

#### CPO 17.5

Projects giving rise to adverse effects on the integrity of European sites (cumulatively, directly or indirectly) arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall not be permitted on the basis of this plan

#### CPO 17.6

Ensure that development proposals, contribute as appropriate towards the protection and where possible enhancement of the ecological coherence of the European Site network and encourage



the retention and management of landscape features that are of major importance for wild fauna and flora as per Article 10 of the EU Habitats directive. All projects and plans arising from this Plan will be screened for the need to undertake Appropriate Assessment under Article 6 of the Habitats Directive.

#### CPO 17.7

To maintain the conservation value of all proposed and future Natural Heritage Areas (NHAs) and to protect other designated ecological sites in Wicklow.

#### CPO 17.8

Ensure ecological impact assessment is carried out for any proposed development likely to have a significant impact on proposed Natural Heritage Areas (pNHAs), Natural Heritage Areas (NHAs), Statutory Nature Reserves, Refuges for Fauna, Annex I habitats, or rare and threatened species including those species protected by law and their habitats. Ensure appropriate avoidance and mitigation measures are incorporated into development proposals as part of any ecological impact assessment.

#### CPO 17.12

To protect non-designated sites from inappropriate development, ensuring that ecological impact assessment is carried out for any proposed development likely to have a significant impact on locally important natural habitats, species or wildlife corridors. Ensure appropriate avoidance and mitigation measures are incorporated into development proposals as part of any ecological impact assessment.

#### CPO 17.14

Ensure that development proposals support the protection and enhancement of biodiversity and ecological connectivity within the plan area in accordance with Article 10 of the Habitats Directive, including linear landscape features like watercourses (rivers, streams, canals, ponds, drainage channels, etc), woodlands, trees, hedgerows, road and railway margins, semi-natural grasslands, natural springs, wetlands, stonewalls, geological and geo-morphological systems, features which act as stepping stones, such as marshes and woodlands, other landscape features and associated wildlife where these form part of the ecological network and/or may be considered as ecological corridors or stepping stones that taken as a whole help to improve the coherence of the European network in Wicklow.

#### CPO 17.15

To protect and enhance wetland sites that are listed as being of C+ or higher importance in the County Wicklow wetlands survey and any subsequent updates or revisions thereof and to implement the recommendations of the County Wicklow wetlands survey.

#### CPO 17.17

Work with statutory authorities to prevent and control the spread of invasive plant and animal species and require, where appropriate Invasive Species Management Plans to be prepared as part of the development management process where necessary.

#### CPO17.18

To promote the preservation of trees, groups of trees or woodlands in particular native tree species, and those trees associated with demesne planting, in the interest of the long-term sustainability of a stable ecosystem amenity or the environment generally, as set out in Schedule 17.05 and Maps 17.05 and 17.05A - H of this plan.

#### CPO 17.22

To require and ensure the preservation and enhancement of native and semi-natural woodlands, groups of trees and individual trees, as part of the development management process, and require

the planting of native broad leaved species, and species of local provenance in all new developments

CPO 17.24

To ensure and support the implementation of the EU Groundwater Directive and the EU Water Framework Directive and associated River Basin and Sub-Basin Management Plans and Blue Dot Catchment Programme, to ensure the protection, improvement and sustainable use of all waters in the County, including rivers, lakes, ground water, coastal and estuarine waters, and to restrict development likely to lead to a deterioration in water quality. The Council will also have cognisance of, where relevant, the EU's Common Implementation Strategy Guidance Document No. 20 and 36 which provide guidance on exemptions to the environmental objectives of the Water Framework Directive.

CPO 17.25

Ensure that floodplains and wetlands are retained for their biodiversity and ecosystems services value and resist development and activities that would interfere with the natural water cycle to a degree that would interfere with the survival and stability of these natural habitats.

CPO 17.26

Protect rivers, streams and other water courses by avoiding interference with river / stream beds, banks and channels and maintaining a core riparian buffer zone of generally 25m along watercourses (or other width, as determined by the Planning Authority having particular regard to 'Planning for Watercourses in the Urban Environment' by Inland Fisheries Ireland for urban locations) free from inappropriate development, with Wicklow County Development Plan 2022-2028 Chapter 17 | Natural Heritage & Biodiversity undeveloped riparian vegetation strips, wetlands and floodplains generally being retained in as natural a state as possible. Structures such as bridges should be clear span, and designed and built in accordance with Inland Fisheries Ireland guidance.

Plans and developments within the other local authority areas which could influence conditions in Irish Sea via rivers and other surface water features, also must comply with the policies and objectives relevant to the protection of European sites and water quality. These include the Dublin City Development Plan 2022-2028<sup>54</sup> and the Dún Laoghaire-Rathdown County Development Plan 2022-2028<sup>55</sup>. The relevant policies and objectives in those plans for the protection of European sites and water quality are included in Appendix I.

As noted under the surface water and foul water sections above, Irish Sea is currently unpolluted and the proposed development will not result in any measurable effect on water quality in Irish Sea. There are also protective policies and objectives in place at a strategic planning level to protect water quality in Irish Sea.

Therefore, and having regard to the policies and objectives referred to under the relevant development plans, it is concluded that the possibility of any other plans or projects acting in combination with the proposed development to give rise to significant effects on any European site in, or associated with, the Irish Sea can be excluded.

The main development with the potential for cumulative effect is the adjacent, consented Tinakilly Phase 1, located directly south of the proposed development. The remaining majority of nearby planning applications are concerned with minor adjustments/ renovations to existing houses, and thus these small-

---

<sup>54</sup> Dublin City Council (2022). *Dublin City Development Plan 2022-2028*. Plan as now effective [Development Plan 2022 - 2028 | Dublin City Council](#). Accessed on: 22<sup>nd</sup> June 2023

<sup>55</sup> Dún Laoghaire-Rathdown County Council (2022). *Dún Laoghaire-Rathdown County Development Plan 2022-2028*. Plan as now effective, <https://www.dlrco.ie/en/county-development-plan/county-development-plan-2022-2028>. Accessed on: 22<sup>nd</sup> June 2023

scale developments are covered under the appropriate policies and objectives of the Wicklow County Development Plan, referred to above.

Therefore, it is concluded that without mitigation any other large -scale projects acting in combination with the proposed development has the potential to give rise to significant effects on any European site in, or associated with, the Irish Sea.

### 6.3 Habitat degradation as a result of Hydrogeological impacts

The proposed development lies within the Wicklow Groundwater Body (Dublin GWB). There are four European sites within the Wicklow GWB that are designated for groundwater dependant habitats and/or species:

- The Murrough Wetlands SAC, located approximately 440m east;
- Magherabeg Dunes SAC, 7.5km south-east;
- Buckroney-Brittis Dunes and Fen SAC, 10.8km south-east; and
- Knocksink Wood SAC, 22.8km north-west.

The following Qualifying Interest (QI) habitats of the above SACs are dependent upon the existing condition and functioning of the groundwater regime:

- Alkaline fens (The Murrough Wetlands SAC and Buckroney-Brittis Dunes and Fen SAC);
- Calcareous fens with *Cladium mariscus* and species of the Caricion davallinae\* (The Murrough Wetlands SAC);
- Petrifying springs with tufa formation (Cratoneurion)\* (Magherabeg Dunes SAC and Knocksink Wood SAC); and
- Humid dune slacks (Buckroney-Brittis Dunes and Fen SAC).

Two of these habitats, calcareous fens with *Cladium mariscus* and species of the Caricion davallinae and petrifying springs with tufa formation (Cratoneurion)\*, are listed as priority habitats in the EU Habitats Directive, identified by the asterisk (\*).

Based on information published by the Geological Survey Ireland (GSI) on the Wicklow GWB<sup>51</sup>, 'the groundwater will discharge directly to the sea along the coast'. As the proposed development is located away from the SACs along the coast, with the exception of The Murrough Wetlands SAC, it cannot influence groundwater conditions in these European sites. With regard to the Murrough Wetlands SAC, the known locations of fens for which the European site is designated for are located approximately 7.3km north-east of the proposed development, considering the distance and the fact that the proposed development will not interact directly with the underlying groundwater body, as such, it cannot influence groundwater conditions at the locations of the QI fen habitats of The Murrough Wetlands SAC.

Therefore, there is no possibility of the proposed development undermining the conservation objectives of any of the Qualifying Interests or Special Conservation Interests of any European sites, either alone or in combination with any other plans or projects, as a result of hydrogeological effects.

### 6.4 Habitat degradation as a result of introducing/spreading non-native invasive species

The ecological surveys carried out within the proposed development recorded two species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended), Himalayan balsam and Spanish bluebell (or its hybrid). In the absence of mitigation, there is potential for this to spread or be introduced, during construction and / or routine maintenance / management works, to terrestrial habitat areas in European sites downstream. The introduction and / or spread of these invasive species to downstream European sites could potentially result in the degradation of existing habitats present, in particular coastal habitats not permanently or regularly inundated by seawater. These species may outcompete other native species present, negatively impacting the species composition,

diversity and abundance and the physical structural integrity of the habitat. This in turn could undermine the conservation objectives of these European sites.

As the proposed development has the potential to result in habitat degradation of the Qualifying / Special Conservation Interest species of European sites as the result of the spread of invasive species, there is potential for cumulative effects to occur in this regard.

## 6.5 Disturbance and displacement impacts

Construction-related disturbance and displacement of fauna species could potentially occur within the vicinity of the proposed development. For mammal species such as otter, disturbance effects would not be expected to extend beyond 150m<sup>56</sup>. For birds, disturbance effects would not be expected to extend beyond a distance of approximately 300m, as noise levels associated with general construction activities would attenuate to close to background levels at that distance<sup>57</sup>.

Evidence of the QI mammal species, otter, potentially associated with the Wicklow Mountains SAC, has been recorded along the northern boundary of the proposed development site within the disturbance ZOI of the proposed development site. Therefore, otter associated with the Wicklow Mountains SAC have the potential to be disturbed or displaced from the surrounding area due to the disturbance associated with the construction of the proposed development, including the provision of vehicular access over the Rathnew Stream.

The Murrough SPA is located just outside the disturbance ZOI for birds, at approximately 440m east of the proposed development, however there are terrestrial habitat areas within the disturbance ZOI of the proposed development that potentially support populations of SCI species of this European site<sup>58</sup>.

As the proposed development will potentially result in the disturbance/displacement of the Qualifying/Special Conservation Interest species of any European site, there is potential for in combination effects to occur in that regard.

## 6.6 Mortality risk

The construction of the proposed northern access road across the Rathnew Stream has the potential to cause direct mortality to otter, potentially associated with the Wicklow Mountain SAC. However, as otter are known to tolerate human disturbance under certain circumstances<sup>20</sup> considering the location of the proposed development in proximity to an existing urban area, the crepuscular (active at dusk and dawn) nature of otter and that no proposed works will take place at night; the proposed development is not considered to have the potential to result in direct mortality of otter.

---

<sup>56</sup> This is consistent with Transport Infrastructure Ireland (TII) guidance (Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (NRA 2006) and Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes) (NRA 2005) documents. This is a precautionary distance, and likely to be moderated by the screening effect provided by surrounding vegetation and buildings, with the actual ZOI of construction related disturbance likely to be much less in reality.

<sup>57</sup> The disturbance zone of influence for waterbirds is based on the relationship between the noise levels generated by general construction traffic/works (BS 5228:2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1 Noise) and the proximity of those noise levels to birds – as assessed in Cutts, N. Phelps, A. & Burdon, D. (2009) *Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance*, and Wright, M., Goodman, P & Cameron, T. (2010) Exploring Behavioural Responses of Shorebirds to Impulsive Noise. *Wildfowl* (2010) 60: 150–167. At 300m, noise levels are below 60dB or, in most cases, are approaching the 50dB threshold below which no disturbance or displacement effects would arise.

<sup>58</sup> There is a need to consider use of habitat areas outside of an SPA by SCI bird species where they support the SCI populations and the site's conservation objectives. These habitat areas can comprise alternative roosting sites, foraging areas, staging grounds or migration routes and can, but not necessarily exclusively, be situated within the immediate hinterland of the SPA, or in areas ecologically connected to it.

## 6.7 Summary

The potential impacts associated with the proposed development have the potential to affect the receiving environment and, as a result, the conservation objectives supporting the QI/SCIs of three European sites: Wicklow Mountains SAC, The Murrrough Wetlands SAC and the Murrrough SPA.

The potential impacts of the proposed development on the receiving environment, their zone of influence, and the European sites at risk of likely significant effects are summarised in Table 2 below.

**Table 2 Summary of the potential impacts of the proposed development on the receiving environment, their potential zone of influence, and the European sites within the zone of influence**

Potential Direct or Indirect Impacts and zone of influence of the Potential Effects	Are there any European sites within the zone of influence?
Habitat loss Habitat loss will be confined to the lands within the proposed development boundary.	Yes There is the potential for loss of resting, foraging and commuting habitat of otter, potentially associated with the Wicklow Mountains SAC
Habitat degradation as a result of hydrological impacts Habitats and species downstream of the proposed development site and the associated surface water drainage discharge points, and downstream of the Wicklow town WwTP.	Yes There are European sites at risk of hydrological effects associated with the construction of the proposed development especially the northern access road across the Rathnew Stream, these include the Murrrough Wetlands SAC, The Murrrough SPA, Wicklow Mountains SAC (otter).
Habitat degradation as a result of hydrogeological impacts Groundwater dependant habitats, and the species those habitats support, in the local area that lie downgradient of the proposed development site.	No There are no European sites which are downgradient of the proposed development site at risk of hydrogeological impacts
Habitat degradation as a result of introducing/spreading non-native invasive species Habitat areas within, adjacent to, and potentially downstream of the proposed development site.	Yes There are two non-native invasive species present on the proposed development site. Therefore, there is a risk associated with the spread/introduction of these species from the proposed development to downstream European sites, The Murrrough Wetlands SAC and The Murrrough SPA.
Disturbance and displacement impacts Potentially up to several hundred metres from the proposed development boundary, dependent upon the predicted levels of noise, vibration and visual disturbance associated with the proposed development, in conjunction with the sensitivity of the qualifying interest species to disturbance effects	Yes There are <i>ex-situ</i> habitats utilised by QI/SCI species of European sites within the potential zone of influence of disturbance effects associated with the construction or operation of the proposed development, including species

	designated under the following European sites: The Murrough SPA and Wicklow Mountains SAC
Mortality risk	No Given the location of the proposed development on the urban edge of Rathnew, the crepuscular nature of otter and that no construction activities will take place at night, the proposed development is not considered to have the potential to result in direct mortality of otter.

## 7 Assessment of Effects on European Sites

This section of the NIS assesses the direct and indirect impacts of the proposed development on the European sites which fall within its zone of influence. For each of these European sites, the assessment below sets out the relevant ecological baseline information, the analysis of the potential impacts, the qualifying interests/special conservation interests at risk of these potential impacts, in view of the sites' conservation objectives, and the mitigation measures (if required) to avoid/reduce the effects of any potential impacts.

The assessment of the proposed development in combination with any other plans or projects on European sites is presented in Section 8.

### 7.1 The Murrough Wetlands SAC [002249]

#### 7.1.1 Ecological Baseline Description for The Murrough Wetlands SAC

The Natura 2000 Standard Data Form (NPWS, 2019) lists the SAC as having an excellent diversity of coastal habitats as well as the most extensive continuous wetland habitats on the east coast stretching for 15km, including both brackish and freshwater marshes, alkaline fens and saltmarsh. Formerly the area of wetland was more extensive but the integrity of the site has been diminished through drainage, agricultural improvement and levelling of sand hills. It is an important site for winter wildfowl and supports internationally important numbers of light-bellied Brent goose *Branta bernicla hrota* as well as nationally important numbers of several species. Many other Annex I species are also present. The site is also of importance for the populations of rare invertebrate and plant species that it supports.

#### 7.1.2 Qualifying Interests and Conservation Objectives of The Murrough Wetlands SAC

The qualifying interests of the Murrough Wetlands SAC, and the overall conservation objective, are listed below in Table 3.

**Table 3 Qualifying Interests and Conservation Objectives of The Murrough Wetlands SAC**

Qualifying Interest(s)	Conservation Objective(s)
[1210] Annual Vegetation of drift lines [1220] Perennial Vegetation of stony banks [1330] Atlantic Salt Meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) [1410] Mediterranean Salt Meadows ( <i>Juncetalia maritimi</i> )	To restore the favourable conservation condition of the Annex I habitats for which the SAC has been selected

Qualifying Interest(s)	Conservation Objective(s)
<p>[7210] Calcareous fens with <i>Cladium mariscus</i> and species of the Caricion davalianae*</p> <p>[7230] Alkaline Fens</p> <p>NPWS (2021) Conservation Objectives: The Murrough Wetlands SAC 002249. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.</p>	<p>RECEIVED: 14/08/2023</p>

In conjunction with considering the generic conservation objective for this SAC “To restore the favourable conservation condition of the Annex I habitats for which the SAC has been selected”, the site specific conservation objectives document for The Murrough Wetlands SAC also informed this assessment.

The site specific conservation objectives document sets out the attributes, measures and targets that define the favourable conservation condition of the Qualifying Interests within the European site. Affecting the conservation condition of the Qualifying Interests is deemed to constitute an adverse effect on the integrity of a European site. The specific attributes and targets used to define the conservation objectives of the Qualifying Interests of The Murrough Wetlands SAC are presented in Section 7.1.3.3, **Error! Reference source not found.4.**

### 7.1.3 Examination and Analysis of Potential Direct and Indirect Impacts

The direct and/or indirect impacts by which the proposed development could (in the absence of mitigation measures) potentially affect the conservation objective attributes and targets supporting the conservation condition of the Qualifying Interests of The Murrough Wetlands SAC, are:

- Habitat degradation as a result of hydrological impacts; and
- Habitat degradation as a result of introducing/spreading non-native invasive species.

#### 7.1.3.1 Habitat degradation as a result of hydrological impacts

The release of contaminated surface water runoff and / or an accidental spillage or pollution event into any surface water features during construction, or operation, has the potential to affect water quality in the receiving aquatic environment. Such a pollution event may include: the release of sediment into receiving waters and the subsequent increase in mobilised suspended solids; and the accidental spillage and/or leaks of contaminants into receiving waters. The associated effects of a reduction of surface water quality could potentially extend for a considerable distance downstream of the location of the accidental pollution event or the discharge. The proposed development is hydrologically connected to The Murrough Wetlands SAC via the Rathnew Stream. Therefore, there is potential for the proposed development to result in significant effects which could have implications for the conservation objectives of The Murrough Wetlands SAC as a result of hydrological impacts.

#### 7.1.3.2 Habitat degradation as a result of introducing/spreading non-native invasive species

Five non-native invasive species, listed on the Third Schedule of the (Birds and Natural Habitats) Regulations, are present within 2km of the proposed development, particularly along the River Vartry to the north of the proposed development. Two non-native invasive species, listed on the Third Schedule of the (Birds and Natural Habitats) Regulations, have been recorded within the boundary of the proposed development site; Himalayan Balsam, located along Rathnew Stream and Spanish Bluebell or its hybrid, located within the central and southern treelines. During construction and / or routine maintenance / management work, these species could potentially spread or be introduced to terrestrial habitats located within downstream European sites via surface water features.

The introduction and / or spread of this non-native invasive species to downstream European sites could potentially result in the degradation of existing habitats present, in particular coastal habitats not permanently or regularly inundated by seawater. These species may outcompete other native species



---

present, negatively impacting the species composition, diversity and abundance and the physical structural integrity of the habitat. This in turn could undermine the conservation objectives of these European sites. The proposed development is directly hydrologically connected to the Murrough Wetlands SAC and The Murrough SPA, via the Rathnew Stream, which forms the northern boundary.

Therefore, there is potential for the proposed development to result in significant effects which could have implications for the conservation objectives of The Murrough Wetlands SAC as a result of non-native invasive species spread.

#### 7.1.3.3 Summary

**Error! Reference source not found.**, below, presents a summary of the potential impacts of the proposed development on the qualifying interests of The Murrough Wetlands SAC, and how these impacts relate to affecting the site's conservation objectives.

RECEIVED: 14/08/2023

**Table 4 Potential Impacts/Effects on the Conservation Objectives of The Murrough Wetlands SAC**

Conservation Objectives Attribute/Measure/Target	Potential Impacts Mitigation?	Requiring	Are mitigation measures required?	Residual Impacts?
<b>The Murrough Wetlands SAC</b>				
<b>Annual Vegetation of drift lines [1210]</b>				
To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:				
Habitat area / Hectares / Area increasing, subject to natural processes, including erosion and succession	Yes		Yes	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes	An accidental pollution event during construction or operation could affect surface water downstream in Broadlough. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality (vegetation structure and composition) and area/distribution of intertidal/coastal habitats.		The mitigation measures described in Section 7.1.4.1 to protect water quality in the receiving environment will ensure that surface water quality in the Rathnew Stream, Broadlough and the Irish Sea is protected during construction and operation of the proposed development.	
Physical structure: functionality and sediment supply / Presence/ absence of physical barriers / Restore the natural circulation of sediment and organic matter, without any physical obstructions				
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession				
Vegetation composition: typical species and sub-communities / Percentage cover at a representative number of monitoring stops / Maintain the presence of species-poor communities with typical species: sea rocket ( <i>Cakile maritima</i> ), sea sandwort ( <i>Honckenya peploides</i> ), prickly saltwort ( <i>Salsola kali</i> ) and oraches ( <i>Atriplex</i> spp.)	The introduction and / or spread of invasive species to downstream European sites could potentially result in the degradation of existing habitats present, in particular coastal habitats not permanently or regularly inundated by seawater. These species may outcompete other native species present, negatively impacting the species composition, diversity and abundance and the physical structural integrity of the habitat.		The mitigation measures described in Section 0 will prevent the introduction and/or spread of non-native invasive species to downstream European sites during construction and operation of the proposed development.	
Vegetation composition: negative indicator species / Percentage cover / Negative indicator species cover in any individual monitoring stop should not be more than 25%; no negative indicator species should be present in more than 60% of monitoring stops; cover of negative indicator species across the whole site should not be more than 5%				
<b>Perennial Vegetation of Stony Banks [1220]</b>				
To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:				

<b>Conservation Objectives</b> <b>Attribute/Measure/Target</b>	<b>Potential Impacts Requiring Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession	Yes	Yes	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes	An accidental pollution event during construction or operation could affect surface water downstream in Broadlough. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality (vegetation structure and composition) and area/distribution of intertidal/coastal habitats.	The mitigation measures described in Section 7.1.4.1 to protect water quality in the receiving environment will ensure that surface water quality in the Rathnew Stream, Broadlough and the Irish Sea are protected during construction and operation of the proposed development.	
Physical structure: functionality and sediment supply / Presence/ absence of physical barriers Restore the natural circulation of sediments and organic matter, without any physical obstructions	The introduction and / or spread of invasive species to downstream European sites could potentially result in the degradation of existing habitats present, in particular coastal habitats not permanently or regularly inundated by seawater. These species may outcompete other native species present, negatively impacting the species composition, diversity and abundance and the physical structural integrity of the habitat.	The mitigation measures described in Section 0 will prevent the introduction and/or spread of non-native invasive species to downstream European sites during construction and operation of the proposed development.	
Physical structure: disturbance / Percentage / No more than 20% of the habitat affected by disturbance			
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation composition: communities and typical species / Percentage / Maintain the typical species within the range of vegetated shingle communities			
Vegetation composition: native negative indicator species / Percentage / Native negative indicator species cover in any individual monitoring stop should not be more than 25%; no negative indicator species should be present in more than 60% of monitoring stops			
Vegetation composition: non-native species / Percentage / Non-native species cover in any individual monitoring stop should not be more than 1%; non-native species should not be present in more than 20% of monitoring stops; cover of non-native species across the whole site should not be more than 1%			
<b>Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330]</b> To Restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession	Yes	Yes	No

<b>Conservation Objectives</b> <b>Attribute/Measure/Target</b>	<b>Potential Impacts Requiring Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
Habitat distribution / Occurrence / No decline, subject to natural processes	An accidental pollution event during construction or operation could affect surface water downstream in Broadlough. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality (vegetation structure and composition) and area/distribution of intertidal/coastal habitats.  The introduction and / or spread of invasive species to downstream European sites could potentially result in the degradation of existing habitats present, in particular coastal habitats not permanently or regularly inundated by seawater. These species may outcompete other native species present, negatively impacting the species composition, diversity and abundance and the physical structural integrity of the habitat.	The mitigation measures described in Section 7.1.4.1 to protect water quality in the receiving environment will ensure that surface water quality in the Rathnew Stream, Broadlough and the Irish Sea is protected during construction and operation of the proposed development.  The mitigation measures described in Section 0 will prevent the introduction and/or spread of non-native invasive species to downstream European sites during construction and operation of the proposed development.	
Physical structure: hydrology / Occurrence of human disturbance to hydrology (including impacts on creeks and pans) / No human disturbance			
Vegetation structure: plant height / Standard deviation of median of maximum leaf height from four quadrants of a representative number of 2m x 2m monitoring plots / Standard deviation of median plant height more than 5			
Vegetation structure: disturbed ground / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of disturbed ground less than 5%			
Vegetation structure: zonation / Number of zones covering 1% or more of the habitat / Adequate number of zones present, depending on geographical type of saltmarsh			
Vegetation structure: transitions / Occurrence of natural transitions to semi-natural terrestrial habitats on landward margin / No loss of natural transitions			
Vegetation composition: typical species / Frequency of typical species within a representative number of 2m x 2m monitoring plots / Minimum of twelve typical species recorded across all plots			
Vegetation composition: negative species / Occurrence in habitat; percentage cover of <i>Spartina</i> spp. within 5m radius of the centre of a representative number of monitoring stops / <i>Spartina</i> spp. have not been recorded in the habitat in this SAC and establishment should be prevented			
Other negative Indicators / Occurrence at a representative number of 2m x 2m monitoring plots / No signs of infilling, reclamation, turf-cutting or pollution or other negative indicators			
Indicators of local Distinctiveness / Occurrence and population size/ No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat			
<p><b>Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]</b>                      To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:</p>			

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession	<p>Yes</p> <p>An accidental pollution event during construction or operation could affect surface water downstream in Broadlough. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality (vegetation structure and composition) and area/distribution of intertidal/coastal habitats.</p> <p>The introduction and / or spread of invasive species to downstream European sites could potentially result in the degradation of existing habitats present, in particular coastal habitats not permanently or regularly inundated by seawater. These species may outcompete other native species present, negatively impacting the species composition, diversity and abundance and the physical structural integrity of the habitat.</p>	<p>Yes</p> <p>The mitigation measures described in Section 7.1.4.1 to protect water quality in the receiving environment will ensure that surface water quality in the Rathnew Stream, Broadlough and the Irish Sea is protected during construction and operation of the proposed development.</p> <p>The mitigation measures described in Section 0 will prevent the introduction and/or spread of non-native invasive species to downstream European sites during construction and operation of the proposed development.</p>	<p>No</p>
Habitat distribution / Occurrence / No decline, subject to natural processes			
Physical structure: hydrology / Occurrence of human disturbance to hydrology (including impacts on creeks and pans) / No human disturbance			
Vegetation structure: disturbed ground / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of disturbed ground less than 5%			
Vegetation structure: transitions / Distribution of natural transitions to semi-natural terrestrial habitats on landward margin / No loss of natural transitions			
Vegetation composition: typical species / Frequency of typical species within a representative number of 2m x 2m monitoring plots / Minimum of six typical species recorded across all plots; minimum two typical species in more than 25% of plots (excluding <i>Juncus maritimus</i> )			
Vegetation composition: negative species / Occurrence in habitat; percentage cover of <i>Spartina</i> spp. within 5m radius of the centre of a representative number of monitoring stops / <i>Spartina</i> spp. have not been recorded in the habitat in this SAC and establishment should be prevented			
Other negative Indicators / Occurrence at a representative number of 2m x 2m monitoring plots / No signs of infilling, reclamation, turf-cutting or pollution or other negative indicators			
Indicators of local Distinctiveness / Occurrence and population size/ No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat			
<p><b>Calcareous fens with <i>Cladium mariscus</i> and species of the Caricion davallianae* [7210]</b></p> <p>To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:</p>			
Habitat area / Hectares / Area stable or increasing, subject to natural processes	No	No	No
Habitat distribution / Occurrence / No decline, subject to natural processes			



RECEIVED: 14/08/2023

<b>Conservation Objectives</b> <b>Attribute/Measure/Target</b>	<b>Potential Impacts Requiring Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
Ecosystem function: soil nutrients / Soil pH and appropriate nutrient levels at a representative number of monitoring stops / Maintain soil pH and nutrient status within natural ranges	Terrestrial habitats above the high tide line are not at risk of effects from water pollution in Broadlough.		
Ecosystem function: peat formation / Percentage cover of peat-forming vegetation and water table levels / Maintain active peat formation, where appropriate			
Ecosystem function: hydrology - groundwater levels / Water levels (centimetres); duration of levels; hydraulic gradients; water supply / Maintain, or where necessary restore, appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat			
Ecosystem function: hydrology - surface water flow / Drain density and form / Maintain, or where necessary restore, as close as possible to natural or semi-natural, drainage conditions			
Ecosystem function: water quality / Various / Maintain appropriate water quality, particularly pH and nutrient levels, to support the natural structure and functioning of the habitat			
Vegetation composition: cover of <i>Cladium mariscus</i> / Percentage cover at a representative number monitoring stops / Cover of <i>Cladium mariscus</i> at least 25%			
Vegetation composition: typical vascular plants / Percentage cover at a representative number monitoring stops / Maintain adequate cover of typical vascular plant species			
Vegetation composition: native negative indicator species / Percentage cover at a representative number of monitoring stops / Cover of native negative indicator species at insignificant levels			
Vegetation composition: non-native species / Percentage cover at a representative number of monitoring stops / Cover of non-native species less than 1%			

RECEIVED: 14/08/2023

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Vegetation composition: native trees and shrubs / Percentage cover in local vicinity of a representative number of monitoring stops / Cover of scattered native trees and shrubs less than 10%			
Vegetation composition: algal cover / Percentage cover at, and in local vicinity of, a representative number of monitoring stops / Cover of algae less than 2%			
Vegetation structure: vegetation height / Percentage cover at a representative number of monitoring stops / At least 10% of live shoots more than 1m high			
Physical structure: disturbed bare ground / Percentage cover at, and in local vicinity of, a representative number of monitoring stops / Cover of disturbed bare ground not more than 10%			
Physical structure: tufa formations / Percentage cover in local vicinity of a representative number of monitoring stops / Disturbed proportion of vegetation cover where tufa is present is less than 1%			
Indicators of local distinctiveness / Occurrence and population size / No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat; maintain features of local distinctiveness, subject to natural processes			
Transitional areas between fen and adjacent habitats / Hectares; distribution / Maintain/restore adequate transitional areas to support/protect the <i>Cladium</i> fen habitat and the services it provides			
<b>Alkaline Fens [7230]</b> To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession	No Terrestrial habitats above the high tide line are not at risk of effects from water pollution in Broadlough.	No	No
Habitat distribution / Occurrence / No decline, subject to natural processes			
Ecosystem function: soil nutrients / Soil pH and appropriate nutrient levels at a representative number of monitoring stops / Maintain soil pH and nutrient status within natural ranges			

RECEIVED: 14/08/2023

<b>Conservation Objectives</b> <b>Attribute/Measure/Target</b>	<b>Potential Impacts Requiring</b> <b>Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
Ecosystem function: peat formation / Percentage cover of peat-forming vegetation and water table levels / Maintain active peat formation, where appropriate			
Ecosystem function: hydrology - groundwater levels / Water levels (centimetres); duration of levels; hydraulic gradients; water supply / Maintain, or where necessary restore, appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat			
Ecosystem function: hydrology - surface water flow / Drain density and form / Maintain, or where necessary restore, as close as possible to natural or semi-natural, drainage conditions			
Ecosystem function: water quality / Various / Maintain appropriate water quality, particularly pH and nutrient levels, to support the natural structure and functioning of the habitat			
Vegetation composition: community diversity / Abundance of variety of vegetation communities / Maintain variety of vegetation communities, subject to natural processes			
Vegetation composition: typical brown moss / Percentage cover at a representative number of monitoring stops / Maintain adequate cover of typical brown moss species			
Vegetation composition: typical vascular plants / Percentage cover at a representative number of monitoring stops / Maintain adequate cover of typical vascular plant species			
Vegetation composition: native negative indicator species / Percentage cover at a representative number of monitoring stops / Cover of native negative indicator species at insignificant levels			
Vegetation composition: non-native species / Percentage cover at a representative number of monitoring stops / Cover of non-native species less than 1%			

RECEIVED: 14/08/2023

<b>Conservation Objectives</b> <b>Attribute/Measure/Target</b>	<b>Potential Impacts Requiring Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
Vegetation composition: native trees and shrubs / Percentage cover in local vicinity of a representative number of monitoring stops / Cover of scattered native trees and shrubs less than 10%			
Vegetation composition: algal cover / Percentage cover at, and in local vicinity of, a representative number of monitoring stops / Cover of algae less than 2%			
Vegetation structure: vegetation height / Percentage cover at a representative number of monitoring stops / At least 50% of the live leaves/flowering shoots are more than either 5cm or 15cm above ground surface depending on community type			
Physical structure: disturbed bare ground / Percentage cover at, and in local vicinity of, a representative number of monitoring stops / Cover of disturbed bare ground not more than 10%			
Physical structure: tufa formations / Percentage cover in local vicinity of a representative number of monitoring stops / Disturbed proportion of vegetation cover where tufa is present is less than 1%			
Indicators of local distinctiveness / Occurrence and population size / No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat; maintain features of local distinctiveness, subject to natural processes			
Transitional areas between fen and adjacent habitats / Hectares; distribution / Maintain/restore adequate transitional areas to support/protect the alkaline fen habitat and the services it provides			
Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing and intensity of use of areas by all of the above named species, other than that occurring from natural patterns of variation			



#### 7.1.4 Mitigation Measures

This section presents the mitigation measures that will be implemented during construction and operation to avoid or reduce the potential impacts of the proposed development on The Murrough Wetlands SAC. All of the mitigation measures will be implemented in full and are best practice, and tried and tested, effective control measures to protect the receiving environment.

##### 7.1.4.1 Measures to Protect Surface Water Quality

This section presents the mitigation measures that will be implemented during construction and operation to avoid the potential impacts of the proposed development on downstream European sites. All of the mitigation measures will be implemented in full. They are in accordance with best practice, and tried and tested, effective control measures to protect the receiving environment.

##### Measures to Protect Surface Water Quality during Construction

Full detail of mitigation measures to be implemented in the development's construction phase are given in the Construction Surface Water Management Plan prepared by CS Consulting, and Chapter 7 – Hydrology in the accompanying EIAR which are submitted separately with this application.

- Site compound, car parking and material storage areas will be located at least 50m from any watercourse
- Specific measures to prevent the release of sediment over baseline conditions in the downstream receiving water environment, during the construction work. These measures include, but are not limited to, the use of silt fences, silt curtains, settlement lagoons and filter materials.
- Provision of exclusion zones and barriers (e.g. silt fences) between earthworks, stockpiles and temporary surfaces to prevent sediment washing into the existing drainage systems and hence the downstream receiving water environment.
- Provision of temporary construction surface drainage and sediment control measures to be in place before earthworks commence.
- Weather conditions will be taken into account when planning construction activities to minimise risk of run-off from the site.
- Prevailing weather and environmental conditions will be taken into account prior to the pouring of cementitious materials for the works adjacent to any surface water drainage features, or drainage features connected to same. Pumped concrete will be monitored to ensure no accidental discharge. Mixer washings and excess concrete will not be discharged to existing surface water drainage systems. Concrete washout areas will be located remote from any surface water drainage features, to avoid accidental discharge to watercourses. Concrete trucks will not be washed out on site.
- Any fuels or chemicals (including hydrocarbons or any polluting chemicals) will be stored in a designated, secure bunded area(s) within the construction compound to prevent any seepage of potential pollutants into the local surface water network. These designated areas will be clearly sign-posted and all personnel on site will be made aware of their locations and associated risks.
- All mobile fuel bowsers shall carry a spill kit and operatives must have spill response training. All fuel containing equipment such as portable generators shall be placed on drip trays. All fuels and chemicals required to be stored on-site will be clearly marked. Care and attention will be taken during refuelling and maintenance operations. Particular attention will be paid to gradient and ground conditions, which could increase risk of discharge to waters.

- A register of all hazardous substances, which will either be used on site or expected to be present (in the form of soil and/or groundwater contamination) will be established and maintained. This register will be available at all times and shall include as a minimum:
  - Valid Safety Data Sheets;
  - Health & Safety, Environmental controls to be implemented when storing, handling, using and in the event of spillage of materials;
  - Emergency response procedures/precautions for each material; and,
  - The Personal Protective Equipment (PPE) required when using the material.
- All trucks will have a tarpaulin that will cover excavated material as it is being hauled off-site and wheel wash facilities will be provided at all site egress points.
- In the unlikely event that groundwater is encountered during the proposed works and temporary pumping at a localised location is required, the following mitigation measures will be implemented with regard to pollution of soil and groundwater:
  - An appropriate dewatering system and groundwater management system specific to the site conditions will be designed and maintained. These will include measures to minimise any surface water inflow into the excavation, where possible, and the prolonged exposure of groundwater to the atmosphere will be avoided.
  - Qualitative and quantitative monitoring will be adopted to ensure that the water is of sufficient quality to discharge. The use of silt traps will be adopted if the monitoring indicates the requirement for same with no silt or contaminated water permitted to discharge to the receiving water environment.
- Water supplies shall be recycled for use in the wheel wash. All waters shall be drained through appropriate filter material prior to discharge from the construction sites.
- The removal of any made ground material, which may be contaminated, from the construction site and transportation to an appropriate licenced facility shall be carried out in accordance with the Waste Management Act, best practice and guidelines for same.
- Foul drainage from site offices and compounds, where not directed to the existing wastewater network, is to be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations, to prevent the pollution of watercourses.
- An Emergency Response Plan is to be prepared, detailing the procedures to be undertaken in the event of flooding, a spill of chemical, fuel or other hazardous wastes, a fire, or non-compliance incident.
- An Emergency Response Plan is to be prepared, detailing the procedures to be undertaken in the event of flooding, a spill of chemical, fuel or other hazardous wastes, a fire, or non-compliance incident.
- In relation to contaminated land:
  - The appointed contractor will be responsible for regular testing of excavated soils to monitor the suitability of the soil for reuse.
  - Samples of ground suspected of contamination will be tested for contamination during the detailed ground investigation and ground excavated from these areas will be disposed of to a suitably licensed or permitted sites in accordance with the current Irish waste management legislation.
  - Contaminated groundwater, if encountered on site, could result in contaminated waters being discharged from the construction site. Any such contaminated waters is to be treated using best practice and appropriate measures/controls, dependent on the nature of the contamination, prior to discharge.

- Any dewatering in areas of contaminated ground shall be designed by the appointed contractor to minimise the mobilisation of contaminants into the surrounding environment.
- There is to be no direct pumping of contaminated water from the works to the surface water drainage/stream network at any time.
- Implementation of measures to minimise waste and ensure correct handling, storage and disposal of waste (most notably wet concrete and asphalt).
- All of the above measures implemented on site will be monitored throughout the duration of construction to ensure that they are working effectively, to implement maintenance measures if required/applicable and to address any potential issues that may arise.

#### Measures to Protect Surface Water Quality during Operation

Mitigation for the operational phase has been built into the design of the proposed development. A total attenuation storage volume of 3,369m<sup>3</sup> is required to ensure that stormwater runoff from the development does not exceed the greenfield runoff rate for the site, and a total attenuation storage volume of 3,453m<sup>3</sup> is provided. Attenuation storage facilities have been designed to cater for the 1-in-100-year critical storm event plus a 20% allowance for climate change.

The proposed drainage design includes the addition of low water usage sanitary appliances, online water butts, permeable paving, bio swales, attenuation tank with permeability to allow infiltration and attenuation ponds. Attenuation will be in the form of filter drains, attenuation ponds, oversized pipes and permeable paving. These SuDS measures allow a level of treatment and / or attenuation to be provided before discharge to the network, reducing the impact on water quality as well as preventing an increase in runoff rates.

The following SuDS types are proposed for the proposed development:

- Low water usage sanitary appliances;
- Online water butts to collect rainwater;
- Permeable paving;
- bio swales;
- attenuation tank with permeability to allow infiltration; and.
- Attenuation ponds.

As the proposed development is completed monitoring of the development site shall be the responsibility of the developer (or an appointed management company) to carry out any maintenance works required. Until such time as the development is taken in charge by the Local Authority, the developer (or an appointed management company) shall be responsible for monitoring and maintaining the development site and the respective drainage networks.

#### 7.1.4.2 Measures to prevent the spread of Non-native Invasive Species

##### Confirmatory Pre-Construction Survey

The developer will ensure that a confirmatory pre-construction non-native invasive species survey will be undertaken by a suitably qualified specialist to confirm the absence and / or extent of all Third Schedule non-native invasive species within the footprint of the proposed development. Where an infestation is confirmed / identified within the footprint of the proposed development, this will require the implementation of a Non-Native Invasive Species Management Plan.

##### Non-Native Invasive Species Management Plan (ISMP)

Where a pre-construction non-native invasive species re-survey has confirmed the presence of previously identified Third Schedule non-native invasive species, or identifies newly established non-native invasive

species within the footprint of the proposed development, the ISMP produced will provide a detailed description of the infestations (e.g., approximate area of the respective colonies (m<sup>2</sup>), where feasible; approximate total number of stems, pattern of growth and information on other vegetation present), and where necessary, include calculations of volumes of infested soils to be excavated.

The ISMP for the proposed development will be implemented, including the assessment presented in the project non-native ISMP detailing the control measures, as advised by a suitably qualified specialist, in accordance with Transport Infrastructure Ireland's *The Management of Invasive Alien Plant Species on National Roads – Technical Guidance*<sup>59</sup> and *The Management of Invasive Alien Plant Species on National Roads – Standard*<sup>60</sup>, and other species-specific guidance documents including those listed in the non-native ISMP, as necessary.

The developer will ensure that all control measures specified in the proposed developments non-native ISMP shall be implemented by a suitably qualified and licensed specialist prior to the construction of the proposed development to control the spread of newly established non-native invasive species within the footprint of the proposed development. Furthermore, the appointed contractor will adhere to control measures specified within the Non-Native ISMP throughout the Construction Phase of the proposed development.

The site will be monitored after control measures have been implemented and monitoring will take place again in the subsequent years following treatment. Any re-growth will be subsequently treated as detailed in the Proposed Developments non-native ISMP.

#### Measures to Prevent the Spread of Non-Native Invasive Species to Downstream European sites During Operation

Once the proposed development is in operation, the control of invasive species will be subject to the management companies and local authorities management procedures in accordance with relevant legislation. No additional mitigation is required.

#### 7.1.5 Residual Impacts

With the effective implementation of appropriate mitigation measures identified in this NIS, the proposed development poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the QIs of The Murrough Wetlands SAC, and there are, therefore, no residual direct or indirect impacts associated with the proposed development that could adversely affect the integrity of Murrough Wetland SAC.

#### 7.1.6 Conclusion of Assessment for The Murrough Wetlands SAC

Following an examination, analysis and evaluation in light of best scientific knowledge, of all relevant information in respect of the QIs of The Murrough Wetlands SAC, the potential impacts and mitigation measures, and whether or not the predicted impacts would affect the conservation objectives that support the conservation condition of the QIs, it has been concluded that the proposed development does not pose a risk of adversely affecting (either directly or indirectly) the integrity of The Murrough Wetlands SAC

---

<sup>59</sup> TII (2020). The Management of Invasive Alien Plant Species on National Roads – Technical Guidance

<sup>60</sup> TII (2020). The Management of Invasive Alien Plant Species on National Roads – Standard



## 7.2 The Wicklow Mountains SAC [002122]

### 7.2.1 Ecological Baseline Description for Wicklow Mountains SAC

According to the Natura 2000 Standard Data Form (NPWS, 2018). This SAC is an extensive upland site comprising much of the Wicklow Mountains. Most of the site is over 300masl (metres above sea level) and includes the source of many rivers including the Liffey, the Dargle and the Slaney. The dominant habitats of the site include blanket bog, heath and upland grassland. Seven Red Data Book plant species occur, and it supports significant breeding populations of merlin *Falco columbarius* and peregrine *Falco peregrinus*. The SAC is designated for otter, which occurs on several of the riverine systems. Major threats to the site include urbanised areas / human habitation, walking, horse-riding and non-motorised vehicles, paths, tracks and cycling tracks, hunting and collection of wild animals, invasive non-native species, military manoeuvres and grazing.

### 7.2.2 Qualifying Interests and Conservation Objectives of Wicklow Mountains SAC

The Qualifying Interests of Wicklow Mountains SAC, and the overall conservation objective, are listed below in Table 5.

**Table 5 Qualifying Interests and Conservation Objectives of Wicklow Mountains SAC**

Qualifying Interest(s)	Conservation Objective(s)
[3110] Oligotrophic waters containing very few minerals of sandy plains ( <i>Littorelletalia uniflorae</i> ) [3130] Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3160] Natural dystrophic lakes and ponds [4010] Northern Atlantic wet heaths with <i>Erica tetralix</i> [4030] European dry heaths [4060] Alpine and Boreal heaths [6130] Calaminarian grasslands of the <i>Violetalia calaminariae</i> [6230] Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)* [7130] Blanket bogs (* if active bog) [8110] Siliceous scree of the montane to snow levels ( <i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i> ) [8210] Calcareous rocky slopes with chasmophytic vegetation [8220] Siliceous rocky slopes with chasmophytic vegetation [91A0] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [1355] Otter <i>Lutra lutra</i>  NPWS (2017) Conservation Objectives: Wicklow Mountains SAC 002122. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected

In conjunction with considering the generic conservation objectives for this SAC “To maintain or restore the favourable conservation condition of the Annex I habitats and the Annex II species for which the SAC has been selected”, the site specific conservation objectives document for Wicklow Mountains SAC also informed this assessment.

The site specific conservation objectives document sets out the attributes, measures and targets that define the favourable conservation condition of the Qualifying Interests within the European site. Affecting the conservation condition of the Qualifying Interests is deemed to constitute an adverse effect on the integrity of a European site. The specific attributes and targets used to define the conservation objectives of the qualifying interests of Wicklow Mountains SAC are presented in Section 7.2.3.6, Table 6.

### 7.2.3 Examination and Analysis of Potential Direct and Indirect Impacts

The direct and/or indirect impacts by which the proposed development could (in the absence of mitigation measures) potentially affect the conservation objective attributes and targets supporting the conservation condition of the qualifying interests of Wicklow Mountains SAC, are:

- Habitat loss and fragmentation;
- Habitat degradation as a result of hydrological impacts;
- Habitat degradation as a result of introducing/spreading non-native invasive species;
- Disturbance and displacement impacts; and
- Direct Injury / Mortality.

#### 7.2.3.1 Habitat loss and fragmentation

An otter resting place (couch site) and three spraint sites were recorded along the Rathnew Stream during field surveys. It is considered that the proposed development is within the potential home range of male otter associated with the Wicklow Mountains SAC. Given that otter are generally nocturnal in nature and works will typically be carried out during normal daylight working hours, affected otters would be expected to habituate to the altered landscape and any resulting barrier effect would be short-term in nature (construction time for the proposed bridge).

There will be direct habitat loss of non-SAC territory associated with QI otter from Wicklow Mountains SAC, and likely destruction of habitat suitable to support commuting and foraging otter, from the construction of the proposed vehicular crossing of the Rathnew Stream. Given the nature of the setting in close proximity to an existing urban area and the considerable fisheries resource known from the greater Vartry catchment as well as the extent of undeveloped bankside habitats along areas of Broadlough and the River Vartry are such that it is not predicted that the potential impacts could occur to such a degree that the conservation objectives of the Wicklow Mountains SAC QI species otter would be undermined.

Therefore, it is not likely that the construction of the proposed development, including the Rathnew Stream bridge will result in significant loss of otter foraging and/ or commuting habitat.

#### 7.2.3.2 Habitat degradation as a result of hydrological impacts

As the Wicklow Mountains SAC is located upstream of the proposed development, there is no potential for a pollution event of any magnitude to affect any QI habitats or associated plant species for which this European site is designated. However, as the proposed development is hydrologically connected to the Rathnew Stream and Broad Lough, there is potential for impacts to occur on otter populations (a mobile species) associated with the Wicklow Mountains SAC. The release of contaminated surface water runoff and / or an accidental spillage or pollution event into any surface water features during construction, or operation, has the potential to affect water quality in the receiving aquatic environment. Such a pollution event may include: the release of sediment into receiving waters and the subsequent increase in mobilised suspended solids; and the accidental spillage and/or leaks of contaminants into receiving waters. The associated effects of a reduction of surface water quality could in turn negatively affect the otter population through direct contact with pollutants or a decline in fish prey. These potential impacts could occur to such a degree that the conservation objectives of the Wicklow Mountains SAC are undermined.

Therefore, there is potential for the proposed development to result in significant effects which could have implications for the conservation objectives of Wicklow Mountains SAC mobile QI species otter, as a result of hydrological impacts.

#### 7.2.3.3 Habitat degradation as a result of introducing/spreading non-native invasive species

Five non-native invasive species, listed on the Third Schedule of the (Birds and Natural Habitats) Regulations, are present within 2km of the proposed development, particularly along the River Vartry to the north of the proposed development. Two non-native invasive species, listed on the Third Schedule of the (Birds and Natural Habitats) Regulations, have been recorded within the boundary of the Proposed Development site; Himalayan Balsam, located along Rathnew Stream and Spanish Bluebell or its hybrid, located within the central and southern treelines. During construction and / or routine maintenance / management work, these species could potentially spread or be introduced to terrestrial habitats located within downstream European sites via surface water features.

The introduction and / or spread of these non-native invasive species to downstream European sites and along watercourses could potentially result in the degradation of existing habitats present, in particular riparian habitats and coastal habitats not permanently or regularly inundated by seawater. These species may outcompete other native species present, negatively impacting the species composition, diversity and abundance and the physical structural integrity of the habitats. This in turn could undermine the conservation objectives of the Qualifying Interest, otter, of the Wicklow Mountains SAC. The proposed development lies directly adjacent to Rathnew Stream, which forms the northern boundary, and on which three otter spraints and one resting place was recorded during field surveys.

Therefore, there is potential for the proposed development to result in significant effects which could have implications for the conservation objectives of The Wicklow Mountains SAC, specifically the mobile QI species. Otter, as a result of non-native invasive species spread and loss of habitat diversity and habitat integrity.

#### 7.2.3.4 Disturbance and displacement impacts

A temporary and / or permanent increase in noise, vibration and / or human activity levels during the construction and / or operation of the proposed development could result in the disturbance to and / or displacement of QI otter populations present in the vicinity of the proposed development. Such disturbance effects would not be expected to extend beyond a distance of approximately 150m<sup>56</sup> for the majority of the Proposed Scheme, as noise levels associated with general construction activities would attenuate to close to background levels at that distance and beyond. Three number otter spraints and a single resting place (couch site) were recorded along the Rathnew Stream during field surveys. Increased human presence and / or noise and vibration associated with construction works may affect the single couch site and temporarily displace commuting or foraging otter from stretches of the Rathnew Stream. Construction activities in the vicinity of the Rathnew Stream will include the construction of a vehicular bridge crossing over the Rathnew Stream.

Otter are known to tolerate human disturbance under certain circumstances<sup>20</sup>. As construction works will typically be undertaken during normal daylight working hours and otter are generally crepuscular in habit (active at dawn and dusk) and can (in many circumstances) tolerate high levels of human presence and disturbance, temporary displacement of otter from their habitat is extremely unlikely to affect the local otter population.

Therefore, there is no potential for construction of the proposed development to result in significant effects which could have implications for the conservation objectives of Wicklow Mountains SAC as a result of disturbance / displacement impacts.

#### 7.2.3.5 Direct Injury / Mortality

There is potential that an increase in construction related vehicles and machinery during construction would present a significant injury / mortality risk to otter, given the greenfield nature of the proposed

development site and the surrounding lands, as well as the in-stream disturbance associated with the construction of the proposed vehicular bridge crossing the Rathnew Stream. However, it should be noted that the proposed development is located on the periphery of an urban area and therefore, otter utilising the Rathnew Stream are likely to be somewhat habituated to human presence. Otter are known to tolerate human disturbance under certain circumstances<sup>20</sup>. As construction works will typically be undertaken during normal daylight working hours and otter are generally crepuscular in habit (active at dawn and dusk) and can (in many circumstances) tolerate high levels of human presence and disturbance. Therefore, the proposed development is not considered to have the potential to result in direct mortality of otter. The proposed development will not result in any increase in terms of mortality risk to otter during operation.

Therefore, there is no potential for the proposed development to result in significant effects which could have implications for the conservation objectives of Wicklow Mountains SAC as a result of direct injury / mortality impacts to the QI species otter.

#### 7.2.3.6 Summary

Table 6 below presents a summary of the potential impacts of the proposed development on the qualifying interests of Wicklow Mountains SAC, and how these impacts relate to affecting the site's conservation objectives.

RECEIVED: 14/08/2023

**Table 6 Potential Impacts/Effects on the Conservation Objectives of Wicklow Mountains SAC**

Conservation Objectives Attribute/Measure/Target	Potential Impacts Mitigation?	Requiring	Are mitigation measures required?	Residual Impacts?
<b>Wicklow Mountains SAC</b>				
<b>Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110]</b>				
To maintain the favourable conservation condition of the habitat in the SAC, which is defined as follows:				
Habitat area / Hectares / Area stable or increasing, subject to natural processes	No There are no oligotrophic waters designated under Wicklow Mountains SAC within the ZOI of or hydrologically connected to the proposed development		No	No
Habitat distribution / Occurrence / No decline, subject to natural processes				
Typical species / Occurrence / Typical species present, in good condition, and demonstrating typical abundances and distribution				
Vegetation composition: characteristic zonation / Occurrence / All characteristic zones should be present, correctly distributed and in good condition				
Vegetation distribution: maximum depth / Metres / Maintain maximum depth of vegetation, subject to natural processes				
Hydrological regime: water level fluctuations / Metres / Maintain appropriate natural hydrological regime necessary to support the habitat				
Lake substratum quality / Various / Maintain appropriate substratum type, extent and chemistry to support the vegetation				
Water quality: transparency / Metres / Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency				
Water quality: nutrients / Njg/l P; mg/l N / Maintain/restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species				
Water quality: phytoplankton biomass / Njg/l Chlorophyll a / Maintain/restore appropriate water quality to support the habitat, including high chlorophyll a status				



RECEIVED: 14/08/2023

<b>Conservation Objectives</b> <b>Attribute/Measure/Target</b>	<b>Potential Impacts Requiring Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
Water quality: phytoplankton composition / EPA phytoplankton composition metric / Maintain appropriate water quality to support the habitat, including high phytoplankton composition status			
Water quality: attached algal biomass / Algal cover and EPA phytobenthos metric / Maintain/restore trace/absent attached algal biomass (<5% cover) and high phytobenthos status			
Water quality: macrophyte status / EPA macrophyte metric (The Free Index) / Maintain/restore high macrophyte status			
Acidification status / pH units; mg/l / Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes			
Water colour / mg/l PtCo / Maintain/restore appropriate water colour to support the habitat			
Dissolved organic carbon (DOC) / mg/l Maintain/restore / appropriate organic carbon levels to support the habitat			
Turbidity / Nephelometric turbidity units/ mg/l SS/ other appropriate units / Maintain appropriate turbidity to support the habitat			
Fringing habitat: area and condition / Hectares / Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3110			
<b>Natural dystrophic lakes and ponds [3160]</b> To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes	No	No	No
Habitat distribution / Occurrence / No decline, subject to natural processes	There are no dystrophic lakes and ponds designated under Wicklow Mountains SAC within the ZOI of or		
Typical species / Occurrence / Typical species present, in good condition, and demonstrating typical abundances and distribution			

RECEIVED: 14/08/2023

<b>Conservation Objectives</b> <b>Attribute/Measure/Target</b>	<b>Potential Impacts Requiring Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
Vegetation composition: characteristic zonation / Occurrence / All characteristic zones should be present, correctly distributed and in good condition	hydrologically connected to the proposed development		
Vegetation distribution: maximum depth / Metres / Maintain maximum depth of vegetation, subject to natural processes			
Hydrological regime: water level fluctuations / Metres / Maintain appropriate natural hydrological regime necessary to support the habitat			
Lake substratum quality / Various / Maintain appropriate substratum type, extent and chemistry to support the vegetation			
Water quality: transparency / Metres / Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency			
Water quality: nutrients / µg/l P; mg/l N / Maintain/restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species			
Water quality: phytoplankton biomass / Njg/l Chlorophyll a / Maintain/restore appropriate water quality to support the habitat, including high chlorophyll a status			
Water quality: phytoplankton composition / EPA phytoplankton composition metric / Maintain appropriate water quality to support the habitat, including high phytoplankton composition status			
Water quality: attached algal biomass / Algal cover and EPA phytobenthos metric / Maintain/restore trace/absent attached algal biomass (<5% cover) and high phytobenthos status			
Water quality: macrophyte status / EPA macrophyte metric (The Free Index) / Maintain/restore high macrophyte status			
Acidification status / pH units; mg/l / Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes			

RECEIVED: 14/08/2023

<b>Conservation Objectives</b> <b>Attribute/Measure/Target</b>	<b>Potential Impacts Requiring Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
Water colour / mg/l PtCo / Maintain/restore appropriate water colour to support the habitat			
Dissolved organic carbon (DOC) / mg/l / Maintain/restore appropriate organic carbon levels to support the habitat			
Turbidity / Nephelometric turbidity units/ mg/l SS/ other appropriate units / Maintain appropriate turbidity to support the habitat			
Fringing habitat: area and condition / Hectares / Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3160			
<b>Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]</b> To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession	No Terrestrial upland habitats are not at risk of effects from the proposed development site.	No	No
Habitat distribution / Occurrence / No decline, subject to natural processes			
Ecosystem function: soil nutrients / Soil pH and appropriate nutrient levels at a representative number of monitoring stops / Maintain soil nutrient status within natural range			
Community diversity / Abundance of variety of vegetation communities / Maintain variety of vegetation communities, subject to natural processes			
Vegetation composition: cross-leaved heath / Occurrence within 20m of a representative number of monitoring stops / Cross-leaved heath ( <i>Erica tetralix</i> ) present within a 20m radius of each monitoring stop			
Vegetation composition: positive indicator species / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of positive indicator species at least 50%			

RECEIVED: 14/08/2023

<b>Conservation Objectives</b> <b>Attribute/Measure/Target</b>	<b>Potential Impacts Requiring Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
Vegetation composition: lichens and bryophytes / Percentage cover at a representative number of 2m x 2m monitoring stops / Total cover of <i>Cladonia</i> and <i>Sphagnum</i> species, <i>Racomitrium lanuginosum</i> and pleurocarpous mosses at least 10%			
Vegetation composition: ericoid species and crowberry / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of ericoid species and crowberry ( <i>Empetrum nigrum</i> ) at least 15%			
Vegetation composition: dwarf shrub species / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of dwarf shrubs less than 75%			
Vegetation composition: negative indicator species / Percentage cover at a representative number of 2m x 2m monitoring stops / Total cover of negative indicator species less than 1%			
Vegetation composition: non-native species / Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops / Cover of non-native species less than 1%			
Vegetation composition: native trees and shrubs / Percentage cover in local vicinity of a representative number of monitoring stops / Cover of scattered native trees and shrubs less than 20%			
Vegetation composition: bracken / Percentage cover in local vicinity of a representative number of monitoring stops / Cover of bracken ( <i>Pteridium aquilinum</i> ) less than 10%			
Vegetation composition: soft rush / Percentage cover in local vicinity of a representative number of monitoring stops / Cover of soft rush ( <i>Juncus effusus</i> ) less than 10%			
Vegetation structure: <i>Sphagnum</i> condition / Condition at a representative number of 2m x 2m monitoring stops / Less than 10% of the <i>Sphagnum</i> cover is crushed, broken and/or pulled up			

RECEIVED: 14/08/2023

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Vegetation structure: signs of browsing / Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops / Less than 33% collectively of the last complete growing season's shoots of ericoids, crowberry ( <i>Empetrum nigrum</i> ) and bog-myrtle ( <i>Myrica gale</i> ) showing signs of browsing			
Vegetation structure: burning / Occurrence in local vicinity of a representative number of monitoring stops / No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning			
Physical structure: disturbed bare ground / Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops / Cover of disturbed bare ground less than 10%			
Physical structure: drainage / Percentage area in local vicinity of a representative number of monitoring stops / Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%			
Indicators of local distinctiveness / Occurrence and population size / No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat			
<b>European dry heaths [4030]</b>			
To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes	No Terrestrial upland habitats are not at risk of effects from the proposed development site.	No	No
Habitat distribution / Occurrence / No decline, subject to natural processes			
Ecosystem function: soil nutrients / Soil pH and appropriate nutrient levels at a representative number of monitoring stops / Maintain soil nutrient status within natural range			
Community diversity / Abundance of variety of vegetation communities / Maintain variety of vegetation communities, subject to natural processes			



RECEIVED: 14/08/2023

<b>Conservation Objectives</b> <b>Attribute/Measure/Target</b>	<b>Potential Impacts Requiring Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
Vegetation composition: lichens and bryophytes / Number of species at a representative number of 2m x 2m monitoring stops / Number of bryophyte or non-crustose lichen species present at each monitoring stop is at least three, excluding <i>Campylopus</i> and <i>Polytrichum</i> mosses			
Vegetation composition: number of positive indicator species / Number of species at a representative number of 2m x 2m monitoring stops / Number of positive indicator species present at each monitoring stop is at least two			
Vegetation composition: cover of positive indicator species / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of positive indicator species at least 50% for siliceous dry heath and 50-75% for calcareous dry heath			
Vegetation composition: dwarf shrub composition / Percentage cover at a representative number of 2m x 2m monitoring stops / Proportion of dwarf shrub cover composed collectively of bog-myrtle ( <i>Myrica gale</i> ), creeping willow ( <i>Salix repens</i> ) and western gorse ( <i>Ulex gallii</i> ) is less than 50%			
Vegetation composition: negative indicator species / Percentage cover at a representative number of 2m x 2m monitoring stops / Total cover of negative indicator species less than 1%			
Vegetation composition: non-native species / Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops / Cover of non-native species less than 1%			
Vegetation composition: native trees and shrubs / Percentage cover in local vicinity of a representative number of monitoring stops / Cover of scattered native trees and shrubs less than 20%			
Vegetation composition: bracken / Percentage cover in local vicinity of a representative number of monitoring stops / Cover of bracken ( <i>Pteridium aquilinum</i> ) less than 10%			

RECEIVED: 14/08/2023

<b>Conservation Objectives</b> <b>Attribute/Measure/Target</b>	<b>Potential Impacts Requiring Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
Vegetation composition: soft rush / Percentage cover in local vicinity of a representative number of monitoring stops / Cover of soft rush ( <i>Juncus effusus</i> ) less than 10%			
Vegetation structure: senescent ling / Percentage cover at a representative number of 2m x 2m monitoring stops / Senescent proportion of ling ( <i>Calluna vulgaris</i> ) cover less than 50%			
Vegetation structure: signs of browsing / Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops / Less than 33% collectively of the last complete growing season's shoots of ericoids and crowberry ( <i>Empetrum nigrum</i> ) showing signs of browsing			
Vegetation structure: burning / Occurrence in local vicinity of a representative number of monitoring stops / No signs of burning in sensitive areas			
Vegetation structure: growth phases of ling / Percentage cover in local vicinity of a representative number of monitoring stops / Outside sensitive areas, all growth phases of ling ( <i>Calluna vulgaris</i> ) should occur throughout, with at least 10% of cover in the mature phase			
Physical structure: disturbed bare ground / Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops / Cover of disturbed bare ground less than 10%			
Indicators of local distinctiveness / Occurrence and population size / No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat			
<b>Alpine and Boreal heaths [4060]</b> To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes	No	No	No
Habitat distribution / Occurrence / No decline, subject to natural processes			

RECEIVED: 14/08/2023

<b>Conservation Objectives</b> <b>Attribute/Measure/Target</b>	<b>Potential Impacts Requiring Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
Ecosystem function: soil nutrients / Soil pH and appropriate nutrient levels at a representative number of monitoring stops / Maintain soil nutrient status within natural range	Terrestrial upland habitats are not at risk of effects from the proposed development site.		
Community diversity / Abundance of variety of vegetation communities / Maintain variety of vegetation communities, subject to natural processes			
Vegetation composition: lichens and bryophytes / Number of species at a representative number of 2m x 2m monitoring stops / Number of bryophyte or non-crustose lichen species present at each monitoring stop is at least three			
Vegetation composition: positive indicator species / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of positive indicator species at least 66%			
Vegetation composition: dwarf shrub species / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of dwarf shrub species at least 10%			
Vegetation composition: negative indicator species / Percentage cover at a representative number of 2m x 2m monitoring stops / Total cover of negative indicator species less than 10%			
Vegetation composition: non-native species / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of non-native species less than 1%			
Vegetation structure: signs of grazing / Percentage of leaves grazed at a representative number of 2m x 2m monitoring stops / Less than 10% collectively of the live leaves of specific graminoids showing signs of grazing			
Vegetation structure: signs of browsing / Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops / Less than 33% collectively of the last complete growing season's shoots of ericoids and crowberry ( <i>Empetrum nigrum</i> ) showing signs of browsing			

RECEIVED: 14/08/2023

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Vegetation structure: burning / Occurrence in local vicinity of a representative number of monitoring stops / No signs of burning within the habitat			
Physical structure: disturbed bare ground / Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops / Cover of disturbed bare ground less than 10%			
Indicators of local distinctiveness / Occurrence and population size / No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat			
<b>Calaminarian grasslands of the <i>Violetalia calaminariae</i> [6130]</b>			
To maintain the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes	No Terrestrial upland habitats are not at risk of effects from the proposed development site.	No	No
Habitat distribution / Location / No decline, subject to natural processes.			
Physical structure: bare ground / Percentage Cover / Maintain adequate open ground			
Soil toxicity: copper content / µg Cu/g dry weight soil / Maintain high copper (Cu) levels in soil			
Vegetation structure: height and cover / Centimetres; percentage cover / Maintain low and open vegetation			
Vegetation composition: metallophyte bryophytes / Number / Maintain diversity and populations of metallophyte bryophytes			
<b>Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230]*</b>			
To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes	No	No	No
Habitat distribution / Occurrence / No decline, subject to natural processes			

RECEIVED: 14/08/2023

<b>Conservation Objectives</b> <b>Attribute/Measure/Target</b>	<b>Potential Impacts Requiring Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
Ecosystem function: soil nutrients / Soil pH and appropriate nutrient levels at a representative number of monitoring stops / Maintain soil nutrient status within natural range	Terrestrial upland habitats are not at risk of effects from the proposed development site.		
Community diversity / Abundance of variety of vegetation communities / Maintain variety of vegetation communities, subject to natural processes			
Vegetation composition: positive indicator species / Number of species at a representative number of 2m x 2m monitoring stops / Number of positive indicator species present at each monitoring stop is at least seven			
Vegetation composition: high quality indicator species / Number of species at a representative number of 2m x 2m monitoring stops / At least two high quality indicator species for base-rich examples of the habitat and at least one for base-poor examples of the habitat			
Vegetation composition: species richness / Number of species at a representative number of 2m x 2m monitoring stops / Species richness at each monitoring stop at least 25			
Vegetation composition: non-native species / Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops / Cover of non-native species less than or equal to 1%			
Vegetation composition: negative indicator species / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of negative indicator species individually less than or equal to 10% and collectively less than or equal to 20%			
Vegetation composition: <i>Sphagnum</i> cover / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of <i>Sphagnum</i> species less than or equal to 10%			
Vegetation composition: <i>Polytrichum</i> cover / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of <i>Polytrichum</i> species less than or equal to 25%			



RECEIVED: 14/08/2023

<b>Conservation Objectives</b> <b>Attribute/Measure/Target</b>	<b>Potential Impacts Requiring Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
Vegetation composition: shrubs, bracken and heath cover / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of shrubs, bracken ( <i>Pteridium aquilinum</i> ) and heath collectively less than or equal to 5%			
Vegetation structure: forb to graminoid ratio / Percentage cover at a representative number of 2m x 2m monitoring stops / Forb component of forb:graminoid ratio is 20-90%			
Vegetation structure: sward height / Sward height at a representative number of 2m x 2m monitoring stops / Proportion of the sward between 5cm and 50cm tall is at least 25%			
Vegetation structure: litter cover / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of litter less than or equal to 20%			
Physical structure: disturbed bare ground / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of disturbed bare ground less than or equal to 10%			
Physical structure: grazing or disturbance / Area in local vicinity of a representative number of monitoring stops / Area of the habitat showing signs of serious grazing or disturbance less than 20m <sup>2</sup>			
Indicators of local distinctiveness / Occurrence and population size / No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat			
<b>Blanket bogs (* if active bog) [7130]</b> To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, including erosion and succession	No	No	No
Habitat distribution / Occurrence / No decline, subject to natural processes			

RECEIVED: 14/08/2023

<b>Conservation Objectives</b> <b>Attribute/Measure/Target</b>	<b>Potential Impacts Requiring Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
Ecosystem function: soil nutrients / Soil pH and appropriate nutrient levels at a representative number of monitoring stops / Maintain soil nutrient status within natural range	Terrestrial upland habitats are not at risk of effects from the proposed development site.		
Ecosystem function: peat formation / Active blanket bog as a proportion of the total area of Annex I blanket bog habitat / At least 99% of the total Annex I blanket bog area is active			
Ecosystem function: hydrology / Flow direction, water levels, occurrence of drains and erosion gullies / Natural hydrology unaffected by drains and erosion			
Community diversity / Abundance of variety of vegetation communities / Maintain variety of vegetation communities, subject to natural processes			
Vegetation composition: positive indicator species / Number of species at a representative number of 2m x 2m monitoring stops / Number of positive indicator species present at each monitoring stop is at least seven			
Vegetation composition: lichens and bryophytes / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of bryophytes or lichens, excluding <i>Sphagnum fallax</i> , at least 10%			
Vegetation composition: potential dominant species / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of each of the potential dominant species less than 75%			
Vegetation composition: negative indicator species / Percentage cover at a representative number of 2m x 2m monitoring stops / Total cover of negative indicator species less than 1%			
Vegetation composition: non-native species / Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops / Cover of non-native species less than 1%			
Vegetation composition: native trees and shrubs / Percentage cover in local vicinity of a representative number of monitoring stops / Cover of scattered native trees and shrubs less than 10%			

RECEIVED: 14/08/2023

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Vegetation structure: Sphagnum condition / Condition at a representative number of 2m x 2m monitoring stops / Less than 10% of the Sphagnum cover is crushed, broken and/or pulled up			
Vegetation structure: signs of browsing / Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops / Last complete growing season's shoots of ericoids, crowberry ( <i>Empetrum nigrum</i> ) and bog-myrtle ( <i>Myrica gale</i> ) showing signs of browsing collectively less than 33%			
Vegetation structure: burning / Occurrence in local vicinity of a representative number of monitoring stops / No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning			
Physical structure: disturbed bare ground / Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops / Cover of disturbed bare ground less than 10%			
Physical structure: drainage / Percentage area in local vicinity of a representative number of monitoring stops / Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%			
Physical structure: erosion / Percentage area in local vicinity of a representative number of monitoring stops / Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas			
Indicators of local distinctiveness / Occurrence and population size / No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat			
<b>Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>) [8110]</b>			
To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area increasing, subject to natural processes	No	No	No
Habitat distribution / Occurrence / No decline, subject to natural processes			

RECEIVED: 14/08/2023

<b>Conservation Objectives</b> <b>Attribute/Measure/Target</b>	<b>Potential Impacts Requiring</b> <b>Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
Ecosystem function: soil nutrients / Soil pH and appropriate nutrient levels at a representative number of monitoring stops / Maintain soil nutrient status within natural range	Terrestrial upland habitats are not at risk of effects from the proposed development.		
Vegetation composition: lichens and bryophytes / Percentage cover at a representative number of 2m x 2m monitoring stops / Cover of bryophytes and non-crustose lichen species at least 5%			
Vegetation composition: negative indicator species / Percentage cover at a representative number of 2m x 2m monitoring stops / Proportion of vegetation composed of negative indicator species less than 1%			
Vegetation composition: non-native species / Percentage cover at a representative number of 2m x 2m monitoring stops / Proportion of vegetation composed of non-native species less than 1%			
Vegetation composition: positive indicator species / Number of species in local vicinity of a representative number of monitoring stops / At least one positive indicator species present in vicinity of each monitoring stop in block scree			
Vegetation composition: grass species and dwarf shrubs / Percentage cover in local vicinity of a representative number of monitoring stops / Total cover of grass species and dwarf shrubs less than 20%			
Vegetation composition: bracken, native trees and shrubs / Percentage cover in local vicinity of a representative number of monitoring stops / Total cover of bracken ( <i>Pteridium aquilinum</i> ), native trees and shrubs less than 25%			
Vegetation structure: grazing and browsing / Percentage of leaves/ shoots grazed/browsed at a representative number of 2m x 2m monitoring stops / Live leaves of forbs and shoots of dwarf shrubs showing signs of grazing or browsing collectively less than 50%			
Physical structure: disturbance / Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops / Ground disturbed by human and animal paths, scree running, vehicles less than 10%			

RECEIVED: 14/08/2023

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Indicators of local distinctiveness / Occurrence and population size / No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat			
<b>Calcareous rocky slopes with chasmophytic vegetation [8210]</b> To restore the favourable conservation condition of the species in the SAC, which is defined as follows:			
Habitat area / Hectares / Area increasing, subject to natural processes	No Terrestrial upland habitats are not at risk of effects from the proposed development.	No	No
Habitat distribution / Occurrence / No decline, subject to natural processes			
Ecosystem function: soil nutrients / Soil pH and appropriate nutrient levels at a representative number of monitoring stops / Maintain soil nutrient status within natural range			
Vegetation composition: positive indicator fern and Saxifraga species / Number of species in local vicinity of a representative number of monitoring stops / Number of ferns and Saxifraga indicators at each monitoring stop is at least one			
Vegetation composition: positive indicator species / Number of species in local vicinity of a representative number of monitoring stops / Number of positive indicator species at each monitoring stop is at least three			
Vegetation composition: non-native species / Percentage cover in local vicinity of a representative number of monitoring stops / Proportion of vegetation composed of non-native species less than 1%			
Vegetation composition: bracken, native trees and shrubs / Percentage cover in local vicinity of a representative number of monitoring stops / Total cover of bracken (Pteridium aquilinum), native trees and shrubs less than 25%			
Vegetation structure: grazing and browsing / Percentage of leaves/ shoots grazed/browsed in local vicinity of a representative number of monitoring stops / Live leaves of forbs and shoots of dwarf shrubs showing signs of grazing or browsing collectively less than 50%			



RECEIVED: 14/08/2023

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Indicators of local distinctiveness / Occurrence and population size / No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat			
<b>Siliceous rocky slopes with chasmophytic vegetation [8220]</b> To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes	No Terrestrial upland habitats are not at risk of effects from the proposed development.	No	No
Habitat distribution / Occurrence / No decline, subject to natural processes			
Ecosystem function: soil nutrients / Soil pH and appropriate nutrient levels at a representative number of monitoring stops / Maintain soil nutrient status within natural range			
Vegetation composition: positive indicator species / Number of species in local vicinity of a representative number of monitoring stops / At least one positive indicator species present in vicinity of each monitoring stop			
Vegetation composition: non-native species / Percentage cover in local vicinity of a representative number of monitoring stops / Proportion of vegetation composed of non-native species less than 1%			
Vegetation composition: bracken, native trees and shrubs / Percentage cover in local vicinity of a representative number of monitoring stops / Total cover of bracken ( <i>Pteridium aquilinum</i> ), native trees and shrubs less than 25%			
Vegetation structure: grazing and browsing / Percentage of leaves/ shoots grazed/browsed in local vicinity of a representative number of monitoring stops / Live leaves of forbs and shoots of dwarf shrubs showing signs of grazing or browsing collectively less than 50%			
Indicators of local distinctiveness / Occurrence and population size / No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat			

RECEIVED: 14/08/2023

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
<b>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]</b> To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes	No	No	No
Habitat distribution / Occurrence / No decline, subject to natural processes	There is no oak woodland within the Zol or at risk of effects from the proposed development.		
Woodland size Hectares Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size			
Woodland structure: cover and height / Percentage and metres / Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer			
Woodland structure: community diversity and extent / Hectares / Maintain diversity and extent of community types			
Woodland structure: natural regeneration / Seedling:sapling:pole ratio / Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy			
Woodland structure: dead wood / m <sup>3</sup> per hectare; number per hectare / At least 30m <sup>3</sup> /ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter			
Woodland structure: veteran trees / Number per hectare / No decline			
Woodland structure: indicators of local distinctiveness / Occurrence / No decline			
Vegetation composition: native tree cover / Percentage / No decline. Native tree cover not less than 95%			
Vegetation composition: typical species / Occurrence / A variety of typical native species present, depending on woodland type, including oak ( <i>Quercus petraea</i> ) and birch ( <i>Betula pubescens</i> )			

RECEIVED: 14/08/2023

Conservation Objectives Attribute/Measure/Target	Potential Impacts Mitigation?	Requiring Are mitigation measures required?	Residual Impacts?
Vegetation composition: negative indicator species / Occurrence / Negative indicator species, particularly non-native invasive species, absent or under control			
<b>Otter <i>Lutra lutra</i> [1355]</b>			
To maintain the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Distribution / Percentage positive survey sites / No significant decline	Yes	Yes	No
Extent of terrestrial habitat / Hectares / No significant decline. Area mapped and calculated as 716.6ha along river banks/lake shoreline/ around ponds	An accidental pollution event during construction or operation could affect surface water downstream in Rathnew Stream and Broadlough. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the otter population through direct	The mitigation measures described in Section 7.1.3.1 to protect water quality in the receiving environment will ensure that surface water quality in the Rathnew Stream, Broadlough and the Irish Sea during construction and operation of the proposed development.	
Extent of freshwater (river) habitat / Kilometres / No significant decline. Length mapped and calculated as 359.1km			
Extent of freshwater (lake) habitat / Hectares / No significant decline. Area mapped and calculated as 141.8ha			
Couching sites and holts / Number / No significant decline			
Fish biomass available / Kilograms / No significant decline			

<b>Conservation Objectives Attribute/Measure/Target</b>	<b>Potential Impacts Requiring Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
<p>Barriers to connectivity / Number / No significant increase.</p>	<p>contact with pollutants or a decline in fish prey.</p> <p>The introduction and / or spread of this non-native invasive species to downstream European sites and along watercourses could potentially result in the degradation of existing habitats present, in particular riparian habitats and coastal habitats not permanently or regularly inundated by seawater. These species may outcompete other native species present, negatively impacting the species composition, diversity and abundance and the physical structural integrity of the habitats. This in turn could undermine the conservation objectives of the Qualifying Interest, otter, of the Wicklow Mountains SAC</p> <p>There is potential that an increase in construction related vehicles and machinery during construction would present a significant injury / mortality risk to otter, given the greenfield nature of the development site and the surrounding lands, as well as the in-stream disturbance associated with the construction of the proposed vehicular bridge crossing the Rathnew Stream.</p>	<p>introduction and/or spread of non-native invasive species to downstream European sites during construction and operation of the proposed development.</p> <p>The mitigation measures in Section 7.2.4.3 and 7.2.4.4 will ensure the protection of otter throughout the construction period.</p>	

RECEIVED 2008/12/23

RECEIVED: 27/08/2023

#### 7.2.4 Mitigation Measures

This section presents the mitigation measures that will be implemented during construction and operation to avoid or reduce the potential impacts of the proposed development on Wicklow Mountains SAC. All of the mitigation measures will be implemented in full and are best practice, and tried and tested, effective control measures to protect the receiving environment.

##### 7.2.4.1 Measures to Protect Surface Water Quality

###### Measures to Protect Surface Water Quality during Construction

The mitigation measures presented above in Section 7.1.3.1 will protect surface water quality during construction of the proposed development.

###### Measures to Protect Surface Water Quality during Operation

The mitigation measures presented above in Section 7.1.3.1 will protect surface water quality during operation of the proposed development.

##### 7.2.4.2 Measures to Prevent the spread of Non-native Invasive Species

The mitigation measures presented in Section 7.1.4.2 will prevent the spread of non-native Invasive species during construction and operation.

##### 7.2.4.3 Measures to Reduce the Loss of Breeding/ Resting Sites of Otter

Although only a single resting (couch) site was recorded in proximity to the proposed development during field surveys, otter could potentially establish new holt or couch sites within the footprint of the proposed development in the interim.

Therefore, a confirmatory pre-construction check of all suitable otter habitat will be completed within 12 months prior to any construction works commencing. The presence of any new holt / couch sites will be treated and / or protected in accordance with the Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (NRA, 2006)<sup>61</sup>.

##### 7.2.4.4 Measures to Prevent Injury/ Mortality Impacts to Otter

To protect otters from indirect harm during construction, where practicable open excavations will be covered when not in use and backfilled as soon as practicable by the appointed contractor.

Excavations will also be covered at night, where practicable, and any deep excavations which must be left open will have appropriate egress ramps in place to allow mammals to safely exit should they fall in.

Fencing requirements as per the Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes (NRA, 2006) will be erected around the Construction Compounds and other working areas which are in close proximity to significant watercourses and have suitable roaming territory for otter.

#### 7.2.5 Residual Impacts

With the effective implementation of appropriate mitigation measures identified in this NIS, the proposed development poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the QI species otter of Wicklow Mountains SAC, and there are therefore, no residual direct or

---

<sup>61</sup> NRA (2006). Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes.



indirect impacts associated with the proposed development that could adversely affect the integrity of Wicklow Mountains SAC.

### 7.2.6 Conclusion of Assessment for Wicklow Mountains SAC

Following an examination, analysis and evaluation in light of best scientific knowledge, of all relevant information in respect of the Qualifying Interests of Wicklow Mountains SAC, the potential impacts and mitigation measures, and whether or not the predicted impacts would affect the conservation objectives that support the conservation condition of the QIs, it has been concluded that the proposed development does not pose a risk of adversely affecting (either directly or indirectly) the integrity of Wicklow Mountains SAC.

## 7.3 The Murrough SPA [004186]

### 7.3.1 Ecological Baseline Description for The Murrough SPA

The Natura 2000 Standard Data Form (NPWS 2020) lists the site as of high importance for the good numbers and wide variety of waterfowl species that it holds in winter and on passage. This is one of a handful of sites around the south and east coasts at which Reed Warbler *Acrocephalus scirpaceus* has in recent years proved to be a regular breeding species. For some years in the 1980s, Bearded Tit *Panurus biarmicus* bred here at its only site in Ireland, emphasizing the potential of this site to hold the community of reed swamp species present in Great Britain, but largely absent in Ireland. The shingle beach is a breeding site for the country's largest colony of Little Tern *Sterna albifrons*, and supports 19% of the all-Ireland population.

### 7.3.2 Special Conservation Interests and Conservation Objectives of The Murrough SPA

The Special Conservation Interests of The Murrough SPA, and the overall conservation objective, are listed below in Table 3.

**Table 7 Special Conservation Interests and Conservation Objectives of The Murrough SPA**

Special Conservation Interest(s)	Conservation Objective(s)
[A001] Red-throated Diver ( <i>Gavia stellata</i> ) [A043] Greylag Goose ( <i>Anser anser</i> ) [A046] Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A050] Wigeon ( <i>Anas penelope</i> ) [A052] Teal ( <i>Anas crecca</i> ) [A179] Black-headed Gull ( <i>Chroicocephalus ridibundus</i> ) [A184] Herring Gull ( <i>Larus argentatus</i> ) [A195] Little Tern ( <i>Sterna albifrons</i> ) [A999] Wetland and Waterbirds  NPWS (2022a) Conservation Objectives for The Murrough SPA [004186]. First Order Site-Specific Conservation Objectives Version 1.0. Department of Housing, Local Government and Heritage	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA  To maintain or restore the favourable conservation condition of the wetland habitat at The Murrough SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

In conjunction with considering the generic conservation objective for this SPA “To maintain or restore the favourable conservation condition of the bird species for which the SPA has been selected”, the site specific conservation objectives document for Wexford Harbour and Slobs SPA, The Raven SPA and the River Nanny and Shore SPA also informed this assessment.

The site specific conservation objectives documents mentioned above, set out the attributes, measures and targets that define the favourable conservation condition of the SCIs within the European site. Affecting the conservation condition of the special conservation interests is deemed to constitute an

adverse effect on the integrity of a European site. The specific attributes and targets used to define the conservation objectives of the qualifying interests of The Murrrough SPA are presented in Section 6.1.3, **Error! Reference source not found.4.**

### 7.3.3 Examination and Analysis of Potential Direct and Indirect Impacts

The direct and/or indirect impacts by which the proposed development could (in the absence of mitigation measures) potentially affect the conservation objective attributes and targets supporting the conservation condition of the SCIs of The Murrrough SPA, are:

- Habitat loss and fragmentation;
- Habitat degradation as a result of hydrological impacts;
- Habitat degradation as a result of introducing/spreading non-native invasive species; and
- Disturbance and displacement impacts.

#### 7.3.3.1 Habitat loss and fragmentation

The habitats onsite provide some limited foraging potential for wintering SCI species. As the arable regime within the fields proposed for development is currently for winter cereal crop yields, this limits the suitability of the subject lands to generally outside the wintering season. Summer arable crop fields which are left fallow for the wintering period are generally the preferred foraging habitat of wintering species, as well as pastoral, amenity and recreational grasslands. Therefore, given the sub-optimal foraging suitability of the subject lands and the abundance of similar land use types within the wider area, the loss of the winter arable lands within the proposed development will not result in a significant effect on SCI species associated with the Murrrough SPA.

Therefore, there is no potential for the proposed development to result in significant effects which could have implications for the conservation objectives of the Murrrough SPA as a result of habitat loss/fragmentation impacts.

#### 7.3.3.2 Habitat degradation as a result of hydrological impacts

The release of contaminated surface water runoff and / or an accidental spillage or pollution event into any surface water features during construction, or operation, has the potential to affect water quality in the receiving aquatic environment. Such a pollution event may include: the release of sediment into receiving waters and the subsequent increase in mobilised suspended solids; and the accidental spillage and/or leaks of contaminants into receiving waters. The associated effects of a reduction of surface water quality could potentially extend for a considerable distance downstream of the location of the accidental pollution event or the discharge. The proposed development is hydrologically connected to The Murrrough SPA via the Rathnew Stream. Therefore, there is potential for the proposed development to result in significant effects which could have implications for the conservation objectives of The Murrrough SPA as a result of hydrological impacts.

#### 7.3.3.3 Habitat degradation as a result of introducing/spreading non-native invasive species

Five non-native invasive species, listed on the Third Schedule of the (Birds and Natural Habitats) Regulations, are present within 2km of the proposed development, particularly along the River Vartry to the north of the proposed development. Two non-native invasive species, listed on the Third Schedule of the (Birds and Natural Habitats) Regulations, have been recorded from within the Proposed Development site. There is the possibility that these species may establish/ encroach further within the proposed development site in the interim between the surveys carried out and the project progressing to construction stage. Considering this, on a precautionary basis there is the possibility that the proposed development could accidentally introduce or spread non-native invasive species to habitats within downstream European sites via surface water features.

The introduction and / or spread of these non-native invasive species to downstream European sites could potentially result in the degradation of existing habitats present, in particular freshwater coastal habitats not permanently or regularly inundated by seawater. These species may outcompete other native species present, negatively impacting the species composition, diversity and abundance and the physical structural integrity of the habitat. This in turn could undermine the conservation objectives of these European sites. Given the transitional nature of Broadlough and the brackish waters present within, it is considered unlikely that the recorded INNS, Himalayan balsam, would become established. However, there is the potential for this species to establish along the lower stretches of the Rathnew Stream which fall within the boundary of the Murrough SPA. The proposed development is directly hydrologically connected to The Murrough SPA, via the Rathnew Stream, which forms the northern boundary.

#### 7.3.3.4 Disturbance and displacement impacts

The Murrough SPA is located just outside the disturbance ZoI for birds, at approximately 440m east of the proposed development, however there are terrestrial habitat areas within the disturbance ZoI of the proposed development that potentially support populations of SCI species of this European site<sup>58</sup>. The construction of the proposed development will result in a temporary increase in construction-related noise and vibration and human disturbance over a construction period of approximately 48 months. This could potentially result in a short-term (48 month) reduction in the suitability of non-designated adjacent habitats to support ex-situ SCI species that may utilise suitable foraging habitat in the locality of the proposed development, mainly to the east and north-east of the proposed development.

Wintering bird surveys conducted to inform this NIS did not record any usage of these adjacent lands by any SCI species associated with the Murrough SPA. Given the lack of evidence of use of these fields by SCI species and given the similar habitats found in the immediate vicinity of the proposed development and the wider environs, therefore, there is no potential for the proposed development to result in significant effects which could have implications for the conservation objectives of the Murrough SPA as a result of disturbance and displacement impacts.

#### 7.3.3.5 Summary

**Error! Reference source not found.** below presents a summary of the potential impacts of the proposed development on the Special Conservation Interests of The Murrough SPA, and how these impacts relate to affecting the site's conservation objectives.

**Table 8 Potential Impacts/Effects on the Conservation Objectives of The Murrough SPA**

Conservation Objectives Attribute/Measure/Target	Potential Mitigation?	Impacts Requiring	Are mitigation measures required?	Residual Impacts?
<b>The Murrough SPA</b>				
<p>Red-throated Diver (<i>Gavia stellata</i>) [A001], Greylag Goose (<i>Anser anser</i>) [A043], Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046], Wigeon (<i>Anas penelope</i>) [A050], Teal (<i>Anas crecca</i>) [A052], Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179], Herring gull (<i>Larus argentatus</i>) [A184], Little tern (<i>Sterna albifrons</i>) [A195].</p> <p>There is no site specific conservation objectives for this SPA therefore the attributes, measures, and targets below have been developed based on similar objectives layout for Wexford Harbour and slob SPA [004076], The Raven SPA [004019] for Red-throated Diver &amp; River Nanny and Shore SPA [004158] for herring gull.</p> <p>To maintain or restore the favourable conservation condition of the special conservation interests of the SPA, which is defined as follows:</p>				
Population trend / Percentage change / Long term population trend stable or increasing	Yes		Yes	No

RECEIVED: 14/03/2023

RECEIVED  
7/26/2023

<b>Conservation Objectives</b> <b>Attribute/Measure/Target</b>	<b>Potential Impacts Requiring Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
<p>Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing and intensity of use of areas by all of the above named species, other than that occurring from natural patterns of variation</p>	<p>An accidental pollution event during construction or operation could affect surface water downstream in Rathnew Stream and Broadlough. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality the of intertidal/coastal habitats that support the special conservation interest bird species of the SPA. This could potentially affect the use of habitat areas by birds and have long-term effects on the SPA populations.</p> <p>The introduction and / or spread of invasive species to downstream European sites could potentially result in the degradation of existing habitats present, in particular coastal habitats not permanently or regularly inundated by seawater. These species may outcompete other native species present, negatively impacting the species composition, diversity and abundance and the physical structural integrity of the habitat.</p>	<p>The mitigation measures described in Section 7.1.4.1 to protect water quality in the receiving environment will ensure that surface water quality in the Rathnew Stream, Broadlough and the Irish Sea is protected during construction and operation of the proposed development.</p> <p>The mitigation measures described in Section 0 will prevent the introduction and/or spread of non-native invasive species to downstream European sites during construction and operation of the proposed development.</p>	
<p><b>Wetlands [A999]</b> To maintain the favourable conservation condition of wetland habitats within the SPA, which is defined as follows:</p>			

<b>Conservation Objectives Attribute/Measure/Target</b>	<b>Potential Impacts Requiring Mitigation?</b>	<b>Are mitigation measures required?</b>	<b>Residual Impacts?</b>
<p>Habitat area / Hectares / The permanent area occupied by the wetland habitat should be stable other than that occurring from natural patterns of variation</p>	<p>Yes</p> <p>An accidental pollution event during construction or operation could affect surface water downstream in in Rathnew Stream and Broadlough An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality the of intertidal/coastal habitats that support the special conservation interest bird species of the SPA. This could potentially affect the use of habitat areas by birds and have long-term effects on the SPA populations.</p> <p>The introduction and / or spread of invasive species to downstream European sites could potentially result in the degradation of existing habitats present, in particular coastal habitats not permanently or regularly inundated by seawater. These species may outcompete other native species present, negatively impacting the species composition, diversity and abundance and the physical structural integrity of the habitat.</p>	<p>Yes</p> <p>The mitigation measures described in Section 7.1.4.1 to protect water quality in the receiving environment will ensure that surface water quality in the Rathnew Stream, Broadlough and the Irish Sea is protected during construction and operation of the proposed development.</p> <p>The mitigation measures described in Section 0 will prevent the introduction and/or spread of non-native invasive species to downstream European sites during construction and operation of the proposed development.</p>	<p>No</p>



RECEIVED: 24/08/2023

#### 7.3.4 Mitigation Measures

This section presents the mitigation measures that will be implemented during construction and operation to avoid or reduce the potential impacts of the proposed development on The Murrough SPA. All of the mitigation measures will be implemented in full and are best practice, and tried and tested, effective control measures to protect the receiving environment.

##### 7.3.4.1 Measures to Protect Surface Water Quality

###### Measures to Protect Surface Water Quality during Construction

The mitigation measures presented above in Section 7.1.3.1 will protect surface water quality during construction of the proposed development.

###### Measures to Protect Surface Water Quality during Operation

The mitigation measures presented above in Section 7.1.3.1 will protect surface water quality during operation of the proposed development.

##### 7.3.4.2 Measures to Prevent the spread of Non-native Invasive Species

The mitigation measures presented in Section 7.1.4.2 will prevent the spread of non-native Invasive species during construction and operation.

#### 7.3.5 Residual Impacts

With the effective implementation of appropriate mitigation measures identified in this NIS, the proposed development poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the Special Qualifying Interest species of The Murrough SPA, and there are therefore, no residual direct or indirect impacts associated with the proposed development that could adversely affect the integrity of The Murrough SPA.

#### 7.3.6 Conclusion of Assessment for The Murrough SPA

Following an examination, analysis and evaluation in light of best scientific knowledge, of all relevant information in respect of the Special Conservation Interests of The Murrough SPA, the potential impacts and mitigation measures, and whether or not the predicted impacts would affect the conservation objectives that support the conservation condition of the Special Conservation Interests, it has been concluded that the proposed development does not pose a risk of adversely affecting (either directly or indirectly) the integrity of The Murrough SPA.

## 8 In Combination Assessment

### 8.1 Analysis of Potential In Combination Effects

This section of the report presents the assessment carried out to examine whether any other plans or projects have the potential to act in combination with the proposed development to adversely affect the integrity of The Murrough Wetlands SAC, Wicklow Mountains SAC and The Murrough SPA. All other European sites fall beyond the zone of influence of the proposed development. Therefore, there is no potential for any other plans or projects to act in combination with the proposed development to adversely affect the integrity of any other European sites.

As assessed in Section 6, none of the potential impacts associated with the proposed development will result in any perceptible residual effect on the receiving environment or on the qualifying interests/special conservation interests of The Murrough Wetlands SAC, Wicklow Mountains SAC and The Murrough SPA. Therefore, there will not be any residual impacts associated with the proposed development that will adversely affect the conservation objectives supporting the conservation condition of the Qualifying

Interests/Special Conservation Interests of those European sites, and the proposed development in isolation will not adversely affect the integrity of those European site.

There is the potential for other pollution sources within the Vartry WFD catchment and any other catchments that also drain to Broadlough and the Irish Sea to cumulatively affect water quality in the receiving estuarine and marine environments.

The potential for in combination effects to arise in Broadlough and the Irish Sea from any existing or proposed land use plans or developments is regulated and controlled by the environmental protective policies and objectives of the Wicklow County Development Plan 2022-2028<sup>4</sup>. Any existing/proposed plan or project that could potentially affect The Murrough Wetlands SAC or the Murrough SPA, or any other European site, in combination with the proposed development, must adhere to these overarching environmental protective policies and objectives. These policies and objectives will ensure the protection of the European site within the zone of influence of the proposed development, and include the requirement for any future plans or projects to undergo Screening for Appropriate Assessment and/or Appropriate Assessment to examine and assess their effects on European sites, alone and in combination with other plans and projects.

The adjacent lands immediately to the south the proposed development, on the other side of the Tinakilly Lane are currently under development for residential purposes (permitted under WCC reg. ref. 17/219 / ABP ref. 30126118), with areas to the east and west of the proposed development site are zoned for 'Passive Open Space (POS)' and 'RE – Existing Residential', to the south for 'R1 – New Residential' (currently under development as mentioned above); and to the north for 'Passive Open Space (POS)' and the 'Clermont Campus (CC)' in the Wicklow County Development Plan 2022-2028 and therefore the majority of the surrounding lands which have yet to be developed will remain undeveloped based on Wicklow County Council's zoning.

There are specific objectives and policies in the Wicklow County Development Plan 2022-2028 to protect biodiversity, and specifically European sites. Policies CPO17.1, CPO17.4, CPO17.5 and CPO17.6 relate to the protection of European sites, AA and commitments to not permitting projects giving rise to adverse effects on the integrity of European sites without demonstrating there are no alternatives, there are imperative reasons of overriding public interest, and undertaking all compensation measures necessary to ensure the overall coherence of the network of European sites. The Wicklow County Development Plan 2022-2028 also includes policies to protect (from risk of pollution), manage and enhance the counties' surface water and groundwater resources (CPO13.1 and CPO13.21).

Land use plans for the other local authorities (e.g. Dun Laoghaire- Rathdown Council and Dublin City Council) whose functional areas include surface water features which drain to the Irish Sea, were examined and analysed and those land use plans also include protective environmental policies to protect European sites and the receiving surface water environments.

The main project with the potential for cumulative effects is the adjacent consented development of Tinakilly Phase 1 (permitted under WCC reg. ref. 17/219 / ABP ref. 30126118). This consented development has undergone a similar environmental assessment as this proposed development, including an EIAR biodiversity chapter and AA screening. This project has incorporated into its design measures to avoid, reduce and alleviate all potentially significant effects on biodiversity and ruled out the potential for significant effects on European sites, and as such in-combination effects on European sites are not considered to be significant.

## 8.2 Conclusion of In Combination Assessment

As the proposed development itself will not have significant effects on the conservation objectives of any European sites, following full implementation of the mitigation measures listed above and considering the protective environmental policies and objectives in the Wicklow County Development Plan<sup>4</sup> and more widely across all of the other land use plans that seek to protect surface water quality in the catchments that drain to Broadlough and the south-western Irish Sea – Killiney Bay (HA10), there is no potential for any other plans or projects to adversely affect the integrity of any European sites in combination with the proposed development.

## 9 NIS Conclusion

This NIS has examined and analysed, in light of the best scientific knowledge, with respect to those European sites within the zone of influence of the proposed development, the potential impact sources and pathways, the manner in which these could potentially impact on the European sites' Qualifying Interest habitats and species and Special Conservation Interest species and whether the predicted impacts would adversely affect the integrity of The Murrough Wetlands SAC, Wicklow Mountains SAC and The Murrough SPA. There are no other European sites at risk of effects from the proposed development.

Avoidance, design requirements and mitigation measures are set out within this NIS and the effective implementation of these mitigation measures will ensure that any impacts on the conservation objectives of European sites will be avoided during the construction and operational Phases of the proposed development such that there will be no adverse effects on any European sites.

It has been objectively concluded by Scott Cawley Ltd., following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted impacts from the proposed development, and the effective implementation of the mitigation measures prescribed that the proposed development will not adversely affect (either directly or indirectly) the integrity of any European site, either alone or in combination with other plans or projects.

## Appendix I

### Planning policies/objectives relating to the protection of European sites and water quality

Policies and objectives relevant to the proposed development and referenced in the NIS are presented in the following tables. Table 9 covers relevant policies and objectives found in the Wicklow County Development Plan 2022-2028, and includes those covering designated sites, water quality and biodiversity listed in the Chapter. Table 10 covers additional land use plan policies and objectives that are relevant in the wider area, together with the Eastern & Midland Regional Assembly, Regional Spatial & Economic Strategy 2019-2031, on European sites and water quality in the Irish Sea.

Wicklow County Development Plan 2022-2028
<p><b>CPO13.1</b></p> <p>To ensure and support the implementation of the EU Groundwater Directive and the EU Water Framework Directive and associated River Basin and Sub-Basin Management Plans and Blue Dot Catchment Programme, to ensure the protection, improvement and sustainable use of all waters in the County, including rivers, lakes, ground water, coastal and estuarine waters, and to restrict development likely to lead to a deterioration in water quality. The Council will also have cognisance of, where relevant, the EU's Common Implementation Strategy Guidance Document No. 20 and 36 which provide guidance on exemptions to the environmental objectives of the Water Framework Directive.</p> <p><b>CPO 13.5</b></p> <p>To ensure compliance with and to implement the provisions of the Nitrates Directive in so far as it falls within the remit of the Council to do so.</p> <p><b>CPO 13.6</b></p> <p>To encourage and promote the use of catchment-sensitive farming practices, in order to meet Water Framework Directive targets and comply with the River Basin Management Plan.</p> <p><b>CPO 13.16</b></p> <p>Permission will be considered for private wastewater treatment plants for single rural houses where:</p> <ul style="list-style-type: none"> <li>• the specific ground conditions have been shown to be suitable for the construction of a treatment plant and any associated percolation area;</li> <li>• the system will not give rise to unacceptable adverse impacts on ground waters / aquifers and the type of treatment proposed has been drawn up in accordance with the appropriate groundwater protection response set out in the Wicklow Groundwater Protection Scheme (2003);</li> <li>• the proposed method of treatment and disposal complies with Wicklow County Council's Policy for Wastewater Treatment &amp; Disposal Systems for Single Houses (PE ≤ 10) and the Environmental Protection Agency "Waste Water Treatment Manuals"; and</li> <li>• in all cases the protection of ground and surface water quality shall remain the overriding priority and proposals must definitively demonstrate that the proposed development will not have an adverse impact on water quality standards and requirements set out in EU and national legislation and guidance documents</li> </ul> <p><b>CPO 13.21</b></p> <p>Ensure the implementation of Sustainable Urban Drainage Systems (SUDS) in accordance with the Wicklow County Council SuDS Policy to ensure surface water runoff is managed for maximum benefit. In particular to require proposed developments to meet the design criteria of each of the four pillars of SuDS design; Water Quality, Water Quantity, Amenity and Biodiversity.</p> <p><b>CPO 17.1</b></p> <p>To protect, sustainably manage and enhance the natural heritage, biodiversity, geological heritage, landscape and environment of County Wicklow in recognition of its importance for nature conservation and biodiversity and as a non-renewable resource.</p> <p><b>CPO17.2</b></p>

RECEIVED: 14/08/2023

Ensure the protection of ecosystems and ecosystem services by integrating full consideration of these into all decision making.

#### **CPO17.3**

To support and promote the implementation of the County Wicklow Heritage Plan and the County Wicklow Biodiversity Action Plan.

#### **CPO 17.4**

To contribute, as appropriate, towards the protection of designated ecological sites including Special Areas of Conservation (SACs) and Special Protection Areas (SPAs); Wildlife Sites (including proposed Natural Heritage Areas); Salmonid Waters; Flora Protection Order sites; Wildfowl Sanctuaries (see S.I. 192 of 1979); Freshwater Pearl Mussel catchments; and Tree Preservation Orders (TPOs). To contribute towards compliance with relevant EU Environmental Directives and applicable National Legislation, Policies, Plans and Guidelines, including but not limited to the following and any updated/superseding documents: 333 Chapter 17 | Natural Heritage & Biodiversity Draft Wicklow County Development Plan 2021-2027

- EU Directives, including the Habitats Directive (92/43/EEC, as amended)<sup>6</sup>, the Birds Directive (2009/147/EC)<sup>7</sup>, the Environmental Liability Directive (2004/35/EC)<sup>8</sup>, the Environmental Impact Assessment Directive (2011/92/EU, as amended), the Water Framework Directive (2000/60/EC), EU Groundwater Directive (2006/118/EC) and the Strategic Environmental Assessment Directive (2001/42/EC); EU 'Guidance on integrating ecosystems and their services into decision-making' (European Commission 2019)
- National legislation, including the Wildlife Acts 1976 and 2010 (as amended)<sup>9</sup>, European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, the Wildlife (Amendment) Act 2000, the European Union (Water Policy) Regulations 2003 (as amended), the Planning and Development Act 2000 (as amended), the European Communities (Birds and Natural Habitats) Regulations 2011 (SI No. 477 of 2011), the European Communities (Environmental Liability) Regulations 2008 (as amended)<sup>10</sup> and the Flora Protection order 2015.
- National policy guidelines (including any clarifying circulars or superseding versions of same), including 'Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment' (2018), 'Guidance for Consent Authorities regarding Sub-Threshold Development' (2003), 'Tree Preservation Guidelines', 'Landscape and Landscape Assessment' (draft 2000), 'Appropriate Assessment Guidance' (2010);
- Catchment and water resource management plans, including the National River Basin Management Plan 2018-2021 (including any superseding versions of same),
- Biodiversity plans and guidelines, including National Biodiversity Action Plan 2017-2021 (including any superseding versions of same) and the County Wicklow Biodiversity Action Plan;
- Ireland's Environment – An Integrated Assessment 2020 (EPA), including any superseding versions of same), and to make provision where appropriate to address the report's goals and challenges

#### **CPO 17.5**

Projects giving rise to adverse effects on the integrity of European sites (cumulatively, directly or indirectly) arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall not be permitted on the basis of this plan

#### **CPO 17.6**

Ensure that development proposals, contribute as appropriate towards the protection and where possible enhancement of the ecological coherence of the European Site network and encourage the retention and management of landscape features that are of major importance for wild fauna and flora as per Article 10 of the EU Habitats directive. All projects and plans arising from this

Plan will be screened for the need to undertake Appropriate Assessment under Article 6 of the Habitats Directive.

**CPO 17.7**

To maintain the conservation value of all proposed and future Natural Heritage Areas (NHAs) and to protect other designated ecological sites in Wicklow.

**CPO 17.8**

Ensure ecological impact assessment is carried out for any proposed development likely to have a significant impact on proposed Natural Heritage Areas (pNHAs), Natural Heritage Areas (NHAs), Statutory Nature Reserves, Refuges for Fauna, Annex I habitats, or rare and threatened species including those species protected by law and their habitats. Ensure appropriate avoidance and mitigation measures are incorporated into development proposals as part of any ecological impact assessment.

**CPO 17.12**

To protect non-designated sites from inappropriate development, ensuring that ecological impact assessment is carried out for any proposed development likely to have a significant impact on locally important natural habitats, species or wildlife corridors. Ensure appropriate avoidance and mitigation measures are incorporated into development proposals as part of any ecological impact assessment.

**CPO 17.14**

Ensure that development proposals support the protection and enhancement of biodiversity and ecological connectivity within the plan area in accordance with Article 10 of the Habitats Directive, including linear landscape features like watercourses (rivers, streams, canals, ponds, drainage channels, etc), woodlands, trees, hedgerows, road and railway margins, semi-natural grasslands, natural springs, wetlands, stonewalls, geological and geo-morphological systems, features which act as stepping stones, such as marshes and woodlands, other landscape features and associated wildlife where these form part of the ecological network and/or may be considered as ecological corridors or stepping stones that taken as a whole help to improve the coherence of the European network in Wicklow.

**CPO 17.15**

To protect and enhance wetland sites that are listed as being of C+ or higher importance in the County Wicklow wetlands survey and any subsequent updates or revisions thereof and to implement the recommendations of the County Wicklow wetlands survey.

**CPO 17.17**

Work with statutory authorities to prevent and control the spread of invasive plant and animal species and require, where appropriate Invasive Species Management Plans to be prepared as part of the development management process where necessary.

**CPO17.18**

To promote the preservation of trees, groups of trees or woodlands in particular native tree species, and those trees associated with demesne planting, in the interest of the long-term sustainability of a stable ecosystem amenity or the environment generally, as set out in Schedule 17.05 and Maps 17.05 and 17.05A - H of this plan.

**CPO 17.22**

To require and ensure the preservation and enhancement of native and semi-natural woodlands, groups of trees and individual trees, as part of the development management process, and require the planting of native broad leaved species, and species of local provenance in all new developments

**CPO 17.24**

To ensure and support the implementation of the EU Groundwater Directive and the EU Water Framework Directive and associated River Basin and Sub-Basin Management Plans and Blue Dot Catchment Programme, to ensure the protection, improvement and sustainable use of all waters in the County, including rivers, lakes, ground water, coastal and estuarine waters, and to restrict development likely to lead to a deterioration in water quality. The Council will also have



cognisance of, where relevant, the EU's Common Implementation Strategy Guidance Document No. 20 and 36 which provide guidance on exemptions to the environmental objectives of the Water Framework Directive.

**CPO 17.25**

Ensure that floodplains and wetlands are retained for their biodiversity and ecosystems services value and resist development and activities that would interfere with the natural water cycle to a degree that would interfere with the survival and stability of these natural habitats.

**CPO 17.26**

Protect rivers, streams and other water courses by avoiding interference with river / stream beds, banks and channels and maintaining a core riparian buffer zone of generally 25m along watercourses (or other width, as determined by the Planning Authority having particular regard to 'Planning for Watercourses in the Urban Environment' by Inland Fisheries Ireland for urban locations) free from inappropriate development, with Wicklow County Development Plan 2022-2028 Chapter 17 | Natural Heritage & Biodiversity undeveloped riparian vegetation strips, wetlands and floodplains generally being retained in as natural a state as possible. Structures such as bridges should be clear span, and designed and built in accordance with Inland Fisheries Ireland guidance.

Table 9 - Relevant land use plan policies/objectives within Wicklow County Development Plan 2022-2028 relating to the protection of designated sites, water quality and biodiversity.

**Eastern & Midland Regional Assembly, Regional Spatial & Economic Strategy 2019-2031**

**Regional Policy Objective 3.4**

Ensure that all plans, projects and activities requiring consent arising from the Regional Spatial and Economic Strategy are subject to the relevant environmental assessment requirements including SEA, EIA and AA as appropriate. In addition the future strategic development of settlements throughout the Region will have full cognisance of the legal requirements pertaining to sites of International Nature Conservation Interest.

**Regional Policy Objective 7.2**

To achieve and maintain 'Good Environmental Status' for marine waters and to ensure the sustainable use of shared marine resources in the Region, and to promote the development of a cross-boundary and cross-border strategic management and stakeholder engagement framework to protect the marine environment.

**Regional Policy Objective 7.10**

Support the implementation of the Water Framework Directive in achieving and maintaining at least good environmental status for all water bodies in the Region and to ensure alignment between the core objectives of the Water Framework Directive and other relevant Directives, River Basin Management plans and local authority land use plans.

**Regional Policy Objective 7.11**

For water bodies with 'high ecological status' objectives in the Region, local authorities shall incorporate measures for both their continued protection and to restore those water bodies that have fallen below high ecological status and areas 'At Risk' into the development of local planning policy and decision making any measures for the continued protection of areas with high ecological status in the Region and for mitigation of threats to waterbodies identified as 'At Risk' as part of a catchment based approach in consultation with the relevant agencies. This shall include recognition of the need to deliver efficient wastewater facilities with sufficient capacity and thus contribute to improved water quality in the Region.

**Regional Policy Objective 7.12**

Future statutory land use plans shall include Strategic Flood Risk Assessment (SFRA) and seek to avoid inappropriate land use zonings and development in areas at risk of flooding and to integrate sustainable water management solutions (such as SuDS, nonporous

surfacing and green roofs) to create safe places in accordance with the Planning System and Flood Risk Assessment Guidelines for Local Authorities.

**Regional Policy Objective 7.15**

Local authorities shall take opportunities to enhance biodiversity and amenities and to ensure the protection of environmentally sensitive sites and habitats, including where flood risk management measures are planned.

**Regional Policy Objective 7.16**

Support the implementation of the Habitats Directives in achieving an improvement in the conservation status of protected species and habitats in the Region and to ensure alignment between the core objectives of the EU Birds and Habitats Directives and local authority development plans.

**Regional Policy Objective 7.22**

Local authority development plan and local area plans, shall identify, protect, enhance, provide and manage Green Infrastructure in an integrated and coherent manner and should also have regard to the required targets in relation to the conservation of European sites, other nature conservation sites, ecological networks and protected species.

**Regional Policy Objective 10.6**

Delivery and phasing of services shall be subject to the required appraisal, planning and environmental assessment processes and shall avoid adverse impacts on the integrity of the Natura 2000 network.

**Regional Policy Objective 10.7**

Local authority core strategies shall demonstrate compliance with DHPLG Water Services Guidelines for local authorities and demonstrate phased infrastructure – led growth that is commensurate with the carrying capacity of water services and prevent adverse impacts on the integrity of water dependent habitats and species within the Natura 2000 network.

**Regional Policy Objective 10.10**

Support Irish Water and the relevant local authorities in the Region to eliminate untreated discharges from settlements in the short term, while planning strategically for long term growth in tandem with Project Ireland 2040 and in increasing compliance with the requirements of the Urban Waste Water Treatment Directive from 39% today to 90% by the end of 2021, to 99% by 2027 and to 100% by 2040.

**Regional Policy Objective 10.11**

EMRA supports the delivery of the waste water infrastructure set out in Table 10.2, subject to appropriate environmental assessment and the planning process.<sup>62</sup>

**Regional Policy Objective 10.12**

Development plans shall support strategic wastewater treatment infrastructure investment and provide for the separation of foul and surface water networks to accommodate the future growth of the Region.

**Regional Policy Objective 10.15**

Support the relevant local authorities (and Irish Water where relevant) in the Region to improve storm water infrastructure to improve sustainable drainage and reduce the risk of flooding in the urban environment and in the development and provision at a local level of Sustainable Urban Drainage solutions.

**Regional Policy Objective 10.16**

Implement policies contained in the Greater Dublin Strategic Drainage Study (GDSDS), including SuDS.

<sup>62</sup> The Greater Dublin Drainage Project, the Ringsend Wastewater Treatment Plant Project, the Athlone Main Drainage Project and the Upper Liffey Valley Sewerage Scheme

**Regional Policy Objective 10.18**

Local authorities shall ensure adequate surface water drainage systems are in place which meet the requirements of the Water Framework Directive and the associated River Basin Management Plans.

**Dún Laoghaire-Rathdown County Development Plan 2022-2028**

**Policy Objective GIB18: Protection of Natural Heritage and the Environment**

It is a Policy Objective to protect and conserve the environment including, in particular, the natural heritage of the County and to conserve and manage Nationally and Internationally important and EU designated sites - such as Special Protection Areas (SPAs), Special Areas of Conservations (SACs), proposed Natural Heritage Areas (pNHAs) and Ramsar sites (wetlands) - as well as non-designated areas of high nature conservation value known as locally important areas which also serve as ‘Stepping Stones’ for the purposes of Article 10 of the Habitats Directive

**Policy Objective GIB19: Habitats Directive**

It is a Policy Objective to ensure the protection of natural heritage and biodiversity, including European Sites that form part of the Natura 2000 network, in accordance with relevant EU Environmental Directives and applicable National Legislation, Policies, Plans and Guidelines.

**Policy Objective GIB21: Designated Sites**

It is a Policy Objective to protect and preserve areas designated as proposed Natural Heritage Areas, Special Areas of Conservation, and Special Protection Areas. It is Council policy to promote the maintenance and as appropriate, delivery of ‘favourable’ conservation status of habitats and species within these areas.

**Policy Objective GIB22: Non-Designated Areas of Biodiversity Importance**

It is a Policy Objective to protect and promote the conservation of biodiversity in areas of natural heritage importance outside Designated Areas and to ensure that notable sites, habitats and features of biodiversity importance - including species protected under the Wildlife Acts 1976 and 2000, the Birds Directive 1979, the Habitats Directive 1992, Flora (Protection) Order, 2015, Annex I habitats, local important areas, wildlife corridors and rare species - are adequately protected. Ecological assessments will be carried out for all developments in areas that support, or have potential to support, features of biodiversity importance or rare and protected species and appropriate mitigation/ avoidance measures will be implemented. In implementing this policy, regard shall be had to the Ecological Network, including the forthcoming DLR Wildlife Corridor Plan, and the recommendations and objectives of the Green City Guidelines (2008) and ‘Ecological Guidance Notes for Local Authorities and Developers’ (Dún Laoghaire-Rathdown Version 2014)

**Policy Objective GIB23: County-Wide Ecological Network**

It is a Policy Objective to protect the Ecological Network which will be integrated into the updated Green Infrastructure Strategy and will align with the DLR County Biodiversity Action Plan. Creating this network throughout the County will also improve the ecological coherence of the Natura 2000 network in accordance with Article 10 of the Habitats Directive. The network will also include non-designated sites.

**Policy Objective EI7: Water Supply and Wastewater treatment and Appropriate Assessment**

It is a Policy Objective to require that all developments relating to water supply and wastewater treatment are subject to screening for Appropriate Assessment to ensure there are no likely significant effects on the integrity, defined by the structure and function, of any

RECEIVED: 14/08/2023

European sites and that the requirements of Article 6 of the EU Habitats Directive are met. (Consistent with RPO 10.7 of the RSES).

**Policy Objective EI8: Groundwater Protection and Appropriate Assessment**

It is a Policy Objective to ensure the protection of the groundwater resources in and around the County and associated habitats and species in accordance with the Groundwater Directive 2006/118/EC and the European Communities Environmental Objectives (Groundwater) Regulations, 2010. In this regard, the Council will support the implementation of Irish Water's Water Safety Plans to protect sources of public water supply and their contributing catchment.

**Policy Objective EI2: Irish Water Enabling Policies Irish Water's Plans and Programmes**

It is a Policy Objective - in conjunction with the Eastern and Midland Regional Authority, where appropriate - to work with and support Irish Water in the delivery of the strategic objectives and strategic water and wastewater projects and infrastructure as set out in the 'Water Services Strategic Plan' (2015), any subsequent plan, Irish Water's Capital Investment Plan 2020 – 2024, any subsequent Capital Investment Plans and the forthcoming National Water Resources Plan, so as to ensure provision of infrastructure to service settlements in accordance with the Core Strategy of this Plan, and the settlement strategy of the RSES. (Consistent with RPO 10.2, 10.3, 10.11, 10.16 of the RSES).

**Policy Objective EI5: River Basin Management Plans (RMBPs)**

It is a Policy Objective: To ensure the delivery of the relevant policies and objectives of the River Basin Management Plan for Ireland 2018 – 2021 and any subsequent plan, including those relating to protection of water status, improvement of water status, prevention of deterioration and meeting objectives for designated protected sites. To support Irish Water in its implementation of Water Quality Management Plans for ground, surface, coastal and estuarine waters as part of the implementation of the EU Water Framework Directive. To support Irish Water in the development of Drinking Water Protection Plans.

**Policy Objective EI6: Sustainable Drainage Systems**

It is a Policy Objective to ensure that all development proposals incorporate Sustainable Drainage Systems (SuDS).

**Policy Objective EI7: Water Pollution**

It is a Policy Objective to implement the provisions of water pollution abatement measures in accordance with national and EU Directives and other legislative requirements in conjunction with other agencies as appropriate.

**Dublin City Development Plan 2022-2028**

**SI2:**

To support and facilitate Irish Water to ensure the upgrading of wastewater infrastructure, in particular the upgrading of the Ringsend Wastewater Treatment Plant, and to support the development of the Greater Dublin Regional Wastewater Treatment Plant, the North Docklands Sewage Scheme, the Marine Outfall and orbital sewer to be located in the northern part of the Greater Dublin Area to serve the Dublin region as part of the Greater Dublin Strategic Drainage Strategy.

**SI3:**

To ensure that development is permitted in tandem with available water supply and wastewater treatment and to manage development, so that new schemes are permitted only where adequate capacity or resources exists or will become available within the life of a planning permission.

**SI7:**

To promote the progressive reduction of pollution of groundwater and prevent its further pollution

**SI17:**

To require an environmental assessment of all proposed flood protection or flood alleviation works

**SI18:**

To require the use of Sustainable Urban Drainage Systems in all new developments, where appropriate, as set out in the Greater Dublin Regional Code of Practice for Drainage Works.

The following measures will apply:

- The infiltration into the ground through the development of porous pavement such as permeable paving, swales, and detention basins
- The holding of water in storage areas through the construction of green roofs, rainwater harvesting, detention basins, ponds, and wetlands
- The slow-down of the movement of water.

**GI2:**

That any plan/project, either individually or in combination with other plans or projects that has the potential to give rise to significant effect on the integrity of any European site(s), shall be subject to an appropriate assessment in accordance with Article 6(3) and 6(4) of the EU Habitats Directives

**GI23:**

To protect flora, fauna and habitats, which have been identified by Articles 10 and 12 of Habitats Directive, Birds Directive, Wildlife Acts 1976–2012, the Flora (Protection) Order 2015 S.I No. 356 of 2015, European Communities (Birds and Natural Habitats) Regulations 2011 to 2015.

**GI23:**

To protect flora, fauna and habitats, which have been identified by Articles 10 and 12 of Habitats Directive, Birds Directive, Wildlife Acts 1976–2012, the Flora (Protection) Order 2015 S.I No. 356 of 2015, European Communities (Birds and Natural Habitats) Regulations 2011 to 2015.

**GI26:**

To have regard to the conservation and enhancement of significant non-designated areas of ecological importance in accordance with development standards set out in this plan

RECEIVED: 14/08/2023

Table 10 - Relevant land use plan policies/objectives relating to the protection of European sites and water quality in the Irish Sea

## Appendix II

### Species listed under the EU Habitats and Birds Directive or in the Birds of Conservation Concern of Ireland 2020-2026, either recorded onsite or from the desk study.

Desktop records and records of protected, fauna species are listed below in Table 11. In relation to mammal and amphibian species those which are protected under the Habitats Directive are included. In the case of bird species, only those species listed in Annex I of the Birds Directive or on the Birds of Conservation Concern in Ireland (BoCCI (Gilbert *et al.*, 2021))<sup>41</sup> Red List or Amber list are included in the table below.

Common Name/ Scientific Name	Legal Status <sup>63</sup>	Red List Status <sup>64</sup>	Source
<b>Mammals (Terrestrial)</b>			
Otter <i>Lutra lutra</i>	WA, HD_II, V	Least concern	NBDC database record and field survey records along Rathnew Stream
Common pipistrelle <i>Pipistrellus pipistrellus</i>	WA, HD_IV	Least concern	NBDC database record
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	WA, HD_IV	Least concern	NBDC database record
Brown Long-eared Bat <i>Plecotus auritus</i>	WA, HD_IV	Least concern	NBDC database record
Daubenton's bat <i>Myotis daubentonii</i>	WA, HD_IV	Least concern	NBDC database record
Leisler's bat <i>Nyctalus leisleri</i>	WA, HD_IV	Least concern	NBDC database record
<b>Mammals (Marine)</b>			
Bottlenose dolphin <i>Tursiops truncatus</i>	WA, HD_II, IV	N/A	Irish Whale and Dolphin Group
Grey seal <i>Halichoerus grypus</i>	WA, HD_II, V	Least concern	NBDC database record
Harbour porpoise <i>Phocoena phocoena</i>	WA, HD_II, IV	N/A	NBDC database record Irish Whale and Dolphin Group
Harbour seal <i>Phoca vitulina</i>	WA, HD_II, V	Least concern	NPWS database record (T29)
Sowerby's beaked whale <i>Mesoplodon bidens</i>	WA, HD_IV	N/A	Public news

<sup>63</sup> HD\_II/IV/V = Habitats Directive Annexes II/IV/V; BD\_I/II/III = Birds Directive Annex I/II/III; 2

<sup>64</sup> Mammals from Marnell, F., Looney, D. & Lawton, C. (2019) *Ireland Red List No. 12: Terrestrial Mammals*. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.

Birds from Colhoun, K. & Cummins, S. (2013) *Birds of Conservation Concern in Ireland 2014-2019*. Irish Birds 9:523-544.

Amphibians, reptiles and fish from King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., Fitzpatrick, Ú., Gargan, P.G., Kelly, F.L., O'Grady, M.F., Poole, R., Roche, W.K. & Cassidy, D. (2011) *Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish*.



Common Name/ Scientific Name	Legal Status <sup>63</sup>	Red List Status <sup>64</sup>	Source
<b>Birds</b>			
Barn Owl <i>Tyto alba</i>	WA	Red	NBDC database record
Barn swallow <i>Hirundo rustica</i>	WA	Amber	NBDC database record
Bar-tailed godwit <i>Limosa lapponica</i>	WA, BD_I, SCI	Red	NBDC database record
Black-headed gull <i>Chroicocephalus ridibundus</i>	WA, BD II, SCI	Amber	NBDC database record
Black-tailed godwit <i>Limosa limosa</i>	WA, BD II, SCI	Red	NBDC database record
Common Goldeneye <i>Bucephala clangula</i>	BD II, WA, SCI	Red	NBDC database record
Common Greenshank <i>Tringa nebularia</i>	WA, BD II, SCI	Amber	NBDC database record
Common Kestrel <i>Falco tinnunculus</i>	WA	Red	NBDC database record
Common Kingfisher <i>Alcedo atthis</i>	BD I, WA, SCI	Amber	NBDC database record
Common linnet <i>Carduelis cannabina</i>	WA	Amber	NBDC database record
Common redshank <i>Tringa totanus</i>	WA, BD II, SCI	Red	NBDC database record
Common ringed plover <i>Charadrius hiaticula</i>	WA, BD II, SCI	Amber	NBDC database record
Common Sandpiper <i>Actitis hypoleucos</i>	WA	Amber	NBDC database record
Common starling <i>Sturnus vulgaris</i>	WA	Amber	NBDC database record
Common Snipe <i>Gallinago gallinago</i>	WA	Red	NBDC database record
Common Swift <i>Apus apus</i>	WA	Red	NBDC database record
Common Tern <i>Sterna hirundo</i>	BD I, WA, SCI	Amber	NBDC database record
Dunlin <i>Calidris alpina</i>	WA, BD_I, SCI	Red	NBDC database record
Eurasian curlew <i>Numenius arquata</i>	WA, BD_II (II), SCI	Red	NBDC database record
Eurasian Oystercatcher <i>Haematopus ostralegus</i>	WA, BD_II, SCI	Red	NBDC database record
Eurasian Teal <i>Anas crecca</i>	BD_II, WA, SCI	Amber	NBDC database record

Common Name/ Scientific Name	Legal Status <sup>63</sup>	Red List Status <sup>64</sup>	Source
Eurasian wigeon <i>Anas penelope</i>	WA, BD_II (I), III (II), SCI	Amber	NBDC database record
European herring gull <i>Larus argentatus</i>	WA, BD_II (II), SCI	Amber	NBDC database record
European Golden Plover <i>Pluvialis apricaria</i>	BD I, WA, SCI	Red	NBDC database record
European Greenfinch <i>Carduelis chloris</i>	WA	Amber	NBDC database record
Goosander <i>Mergus merganser</i>	WA, BD_II	Amber	NBDC database record
European Shag <i>Phalacrocorax aristotelis</i>	WA, BD_II, SCI	Amber	NBDC database record
Gadwall <i>Anas strepera</i>	BD II, WA, SCI	Amber	NBDC database record
Great Cormorant <i>Phalacrocorax carbo</i>	WA, BD_II, SCI	Amber	NBDC database record
Grey plover <i>Pluvialis squatarola</i>	WA, BD_II, SCI	Red	NBDC database record
Hen Harrier <i>Circus cyaneus</i>	BD I, WA, SCI	Amber	NBDC database record
House martin <i>Delichon urbicum</i>	WA	Amber	NBDC database record
House Sparrow <i>Passer domesticus</i>	WA	Amber	NBDC database record
Lesser black-backed gull <i>Larus fuscus</i>	WA, BD_II, SCI	Amber	NBDC database record
Little egret <i>Egretta garzetta</i>	WA, BD_I	Green	NBDC database record
Mallard <i>Anas platyrhynchos</i>	WA, BD_II (I), III (I), SCI	Amber	NBDC database record
Meadow Pipit <i>Anthus pratensis</i>	WA	Red	NBDC database record
Common/ Mew Gull <i>Larus canus</i>	WA, BD_II, SCI	Amber	NBDC database record
Mute swan <i>Cygnus olor</i>	WA	Amber	NBDC database record
Northern Lapwing <i>Vanellus vanellus</i>	WA, BD II, SCI	Red	NBDC database record
Red kite <i>Milvus milvus</i>	WA, BD_I	Red	NBDC database record
Red Knot <i>Calidris canutus</i>	WA, BD_II, SCI	Red	NBDC database record

RECEIVED: 14/08/2023

Common Name/ Scientific Name	Legal Status <sup>63</sup>	Red List Status <sup>64</sup>	Source
Red-breasted merganser <i>Mergus serrator</i>	WA, BD_II (II), SCI	Amber	NBDC database record
Sand Martin <i>Riparia riparia</i>	WA	Amber	NBDC database record
Sandwich Tern <i>Sterna sandvicensis</i>	WA, BD I, SCI	Amber	NBDC database record
Shelduck <i>Tadorna tadorna</i>	WA, BD_II, SCI	Amber	NBDC database record
Short-eared owl <i>Asio flammeus</i>	WA, BD_I	Amber	NBDC database record
Sky Lark <i>Alauda arvensis</i>	WA	Amber	NBDC database record
Tufted Duck <i>Aythya fuligula</i>	WA, BD II, SCI	Amber	NBDC database record
Water Rail <i>Rallus aquaticus</i>	WA	Amber	NBDC database record
Willow Warbler <i>Phylloscopus trochilus</i>	WA	Amber	NBDC database record
<b>Amphibians</b>			
Common frog <i>Rana temporaria</i>	WA, HD_V	Least concern	NBDC database record NPWS database record
<b>Fish</b>			
River lamprey <i>Lampetra fluviatilis</i>	HD_II, V	Least Concern	IFI survey record (2010)

Table 11 Records of protected and red or Amber-listed fauna from the desktop study and surveys in the vicinity of the study area

### Appendix III

Aquatic baseline report for Tinakilly Demesne Residential Development, Rathnew, Co. Wicklow. Triturus Environmental Ltd.

RECEIVED: 14/08/2023

Aquatic baseline report for Tinakilly  
Demesne Residential Development,  
Rathnew, Co. Wicklow

RECEIVED 14/08/2023



Prepared by Triturus Environmental Ltd. for Scott Cawley Ltd.

**April 2022**

---

Please cite as:

Triturus (2022). Aquatic baseline report for Tinakilly Demesne Residential Development, Rathnew, Co. Wicklow. Report prepared by Triturus Environmental Ltd. for Scott Cawley Ltd. April 2022.

## Table of contents

1. Introduction	3
2. Methodology	4
3. Receiving environment	9
4. Results	10
5. Discussion	19
6. Recommendation	19
7. References	20
8. Appendix A – fisheries habitat	22
9. Appendix B – Q-sample results (biological water quality)	24

RECEIVED: 14/08/2023



## 1. Introduction

### 1.1 Background

The following report provides a baseline assessment of the aquatic ecology and fisheries of watercourses in the vicinity of a proposed residential development at Tinakilly Demesne, Rathnew, Co. Wicklow. The site was bordered by the Rathnew Stream (EPA code: 10R02) and its tributary, the Rossana Lower Stream (10R19), which were the focus of the study.

The aquatic baseline surveys recorded the fisheries potential for species of high conservation value (i.e. salmonids, European eel and lamprey) based on habitat characteristics. The surveys also assessed the value of the watercourses in the vicinity of the proposed development for white-clawed crayfish (*Austropotamobius pallipes*) and evaluated the biological water quality by Q-sampling. The surveys also evaluated the importance of the watercourses for macrophytes, aquatic bryophytes and associated linkages with Annex I habitats. A survey of otter (*Lutra lutra*) on the Rathnew Stream and Rossanna Lower Stream was also undertaken to establish otter presence and utilisation of the streams bordering the study area. The presence of aquatic and riparian invasive species was also noted in the vicinity of the proposed site boundary. Aquatic surveys were undertaken on the 9<sup>th</sup> of April 2022 during base flow conditions.

RECEIVED: 14/06/2023

## 2. Methodology

### 2.1 Selection of watercourses for assessment

Watercourses adjoining the western and northern boundaries of the proposed development were surveyed as part of the current assessment. The  $n=4$  total aquatic survey sites were surveyed on the bordering Rossanna Lower Stream and Rathnew Stream (**Table 2.1; Figure 2.1**). The nomenclature for the watercourses surveyed is as per the Environmental Protection Agency's (EPA) online map viewer.

Please note this aquatic report should be read in conjunction with the Ecological Impact Assessment Report (EclA) prepared for the proposed development by Scott Cawley Ltd. The aquatic survey methodology is outlined in the sections below.

### 2.2 Aquatic site surveys

Surveys of the Rathnew Stream and Rossanna Lower Stream were conducted on the 9<sup>th</sup> April 2022. Survey effort focused on both instream and riparian habitats in the vicinity of each survey site (**Figure 2.1**). The surveys were conducted during bright weather and base flow riverine conditions. The watercourses at each survey site were described in terms of the important aquatic habitats and species. This helped to evaluate species and habitats of ecological value in the vicinity of each site. The aquatic baseline prepared would inform mitigation for the project.

A broad aquatic habitat assessment was conducted utilising elements of the methodology given in the Environment Agency's 'River Habitat Survey in Britain and Ireland Field Survey Guidance Manual 2003' (EA, 2003) and the Irish Heritage Council's 'A Guide to Habitats in Ireland' (Fossitt, 2000). All sites were assessed in terms of:

- Physical watercourse/waterbody characteristics (i.e., width, depth etc.)
- Substrate type, listing substrate fractions in order of dominance (i.e., bedrock, boulder, cobble, gravel, sand, silt etc.)
- River profile in the sampling area
- An appraisal of the macrophyte and aquatic bryophyte community at each site
- Riparian vegetation composition

**Table 2.1** Location of  $n=4$  aquatic survey sites in the vicinity of Tinakilly Demesne Residential Development, Rathnew, Co, Wicklow

Site	Watercourse	EPA code	Location	X (ITM)	Y (ITM)
S1	Rossanna Lower Stream	10R19	Upstream of site boundary, Tinakilly Lane	729173	695516
S2	Rossanna Lower Stream	10R19	Upstream of confluence with Rathnew Stream	729070	695771
S3	Rathnew Stream	10R02	Upstream of confluence with Rossanna Lower Stream	729046	695780
S4	Rathnew Stream	10R02	Adjoining downstream extent of site boundary	729338	695912

RECEIVED: 14/08/2023



**Figure 2.1** Overview of the aquatic survey site locations for the proposed Tinakilly Demesne Residential Development, Rathnew, Co. Wicklow

## 2.3 Otter signs

The presence of otter (*Lutra lutra*) at each aquatic survey site was determined through the recording of otter signs, if encountered incidentally during surveys. The survey broadly followed the best practice survey methodology for otter as recommended by Lenton et al. (1980), Chanin (2003) and Bailey & Rochford (2006). Notes on the age and location (ITM coordinates) were made for each otter sign recorded, in addition to the quantity and visible constituents of spraint (i.e. remains of fish, molluscs etc.).

## 2.4 Fisheries habitat

### 2.4.1 Salmonid habitat

Fisheries habitat quality for salmonids was assessed using the Life Cycle Unit method (Kennedy, 1984; O'Connor & Kennedy, 2002) to map the  $n=4$  riverine sites as nursery, spawning and holding habitat, by assigning quality scores to each type of habitat. Those habitats with poor quality substrata, shallow depth and a poorly defined river profile receive a higher score. Higher scores in the Life Cycle Unit method of fisheries quantification are representative of poorer value, with lower scores being more optimal despite this appearing counter intuitive.

**Table 2.1** Life Cycle Unit scoring system for salmonid nursery, spawning and holding habitat value (as per Kennedy, 1984 & O'Connor & Kennedy, 2002)

Habitat quality	Habitat score	Total score (three components)
Poor	4	12
Moderate	3	9-11
Good	2	6-8
Excellent	1	3-5

### 2.4.2 Lamprey habitat

Lamprey habitat evaluation for each survey site was undertaken using the Lamprey Habitat Quality Index (LHQI) scoring system, as devised by Macklin et al. (2018). The LHQI broadly follows a similar rationale as the Life Cycle Unit score for salmonids. Those habitats with a lack of soft, largely organic sediment areas for ammocoete burrowing, shallow sediment depth (<10cm) or compacted sediment nature receive a higher score. Higher scores in this index are thus of poorer value (in a similar fashion to the salmonid Life Cycle Unit Index), with lower scores being more optimal. Overall scores are calculated as a simple function of the sum of individual habitat scores.

Larval lamprey habitat quality as well as the suitability of adult spawning habitat is assessed based on the information provided in Maitland (2003) and other relevant literature (e.g. Gardiner, 2003). Unlike the salmonid Life Cycle Unit index, holding habitat for adult lamprey is not assessed owing to their

different migratory and life history strategies, and that electro-fishing surveys routinely only sample larval lamprey.

The LHQI scoring system provides additional information compared to the habitat classification based on the observations of Applegate (1950) and Slade et al. (2003), which deals specifically with larval (sea) lamprey settlement habitat. Under this scheme, habitat is classified into three different types: preferred (Type 1), acceptable (Type 2), and not acceptable for larvae (Type 3) (Slade et al., 2003). Type 1 habitat is characterized by soft substrate materials usually consisting of a mixture of sand and fine organic matter, often with some cover over the top such as detritus or twigs in areas of deposition. Type 2 habitat is characterized by substrates consisting of shifting sand with little if any organic matter and may also contain some gravel and cobble (lamprey may be present but at much lower densities than Type 1). Type 3 habitat consists of materials too hard for larvae to burrow including bedrock and highly compacted sediment. This classification can also be broadly applied to other lamprey species ammocoetes, including *Lampetra* species.

**Table 2.2** Lamprey Habitat Quality Index (LHQI) scoring system for lamprey spawning and nursery habitat value (Macklin et al., 2018).

Habitat quality	Habitat score	Total score (two components)
Poor	4	8
Moderate	3	6-7
Good	2	3-5
Excellent	1	2

## 2.5 White-clawed crayfish survey

White-clawed crayfish (*Austropotamobius pallipes*) surveys were undertaken at the aquatic survey sites under a National Parks and Wildlife (NPWS) open licence (no. C31/2022), as prescribed by Sections 9, 23 and 34 of the Wildlife Act (1976-2021), to capture and release crayfish to their site of capture, under condition no. 6 of the licence. As per Inland Fisheries Ireland recommendations, the crayfish licence sampling started at the uppermost site of the survey area to minimise the risk of transfer invasive propagules (including crayfish plague) in an upstream direction.

Hand-searching of instream refugia and sweep netting was undertaken according to Reynolds et al. (2010). Trapping of crayfish was not feasible given the small nature of the watercourses surveyed. An appraisal of white-clawed crayfish habitat at each site was conducted based on physical channel attributes, water chemistry and incidental records in mustelid spraint. Additionally, a desktop review of crayfish records within the wider survey area was undertaken.

## 2.6 Biological water quality (Q-sampling)

The  $n=4$  aquatic survey sites were assessed for biological water quality through Q-sampling on the 9<sup>th</sup> April 2022, (**Table 2.1, Figures 2.1, 2.2**). All samples were taken with a standard kick sampling hand net (250mm width, 500 $\mu$ m mesh size) from areas of riffle/glide utilising a two-minute sample, with an additional one-minute hand search of instream substrata, as per EPA methodology (Feeley et al., 2020a). Samples were elutriated and fixed in 70% ethanol for subsequent laboratory identification. Macro-invertebrate samples were converted to Q-ratings as per Toner et al. (2005). Any rare invertebrate species were identified from the NPWS Red List publications for beetles (Foster et al., 2009), mayflies (Kelly-Quinn & Regan, 2012), stoneflies (Feeley et al., 2020b) and other relevant taxa (i.e., Byrne et al., 2009; Nelson et al., 2011).

**Table 2.2** Reference categories for EPA Q-ratings (Q1 to Q5)

Q Value	WFD Status	Pollution status	Condition
Q5 or Q4-5	High status	Unpolluted	Satisfactory
Q4	Good status	Unpolluted	Satisfactory
Q3-4	Moderate status	Slightly polluted	Unsatisfactory
Q3 or Q2-3	Poor status	Moderately polluted	Unsatisfactory
Q2, Q1-2 or Q1	Bad status	Seriously polluted	Unsatisfactory

## 2.7 Aquatic ecological evaluation

The evaluation of aquatic ecological receptors contained within this report uses the geographic scale and criteria defined in the 'Guidelines for Assessment of Ecological Impacts of National Road Schemes' (NRA, 2009).

## 2.8 Biosecurity

A strict biosecurity protocol including the Check-Clean-Dry approach was adhered to during surveys for all equipment and PPE used. Disinfection of all equipment and PPE before and after use with Virkon™ was conducted to prevent the transfer of pathogens or invasive propagules between survey sites. Surveys were undertaken at sites in a downstream order to minimise the risk of upstream propagule mobilisation. Where feasible, equipment was also thoroughly dried (through UV exposure) between survey areas. Any aquatic invasive species or pathogens recorded within or adjoining the survey areas were geo-referenced.



### 3. Receiving environment

#### 3.1 Rathnew Stream catchment and survey area description

The proposed Tinakilly Demesne residential development is located 0.5km east of Rathnew, Co. Wicklow. The proposed development is bordered to the west by the Rossanna Lower Stream and to the north by the Rathnew Stream within the Vartry\_SC\_010 sub-catchment. The watercourses in the vicinity of the proposed residential development are small to medium-sized lowland depositing watercourses (FW2; Fossitt, 2000).

Land use practices in the wider survey area are dominated by non-irrigated arable land (CORINE 211) and pastures (231), comprising improved agricultural grassland (GA1; Fossitt, 2000) and arable crops (BC1). Predominantly, the watercourses flowed over areas of Lower-Middle Ordovician slate, sandstone, greywacke and conglomerate (Geological Survey of Ireland data).

Fisheries data was not available for the Rathnew Stream or Rossanna Lower Stream. However, Atlantic salmon (*Salmo salar*), brown trout and sea trout (*Salmo trutta*), European eel and lamprey (*Lampetra* sp.) are known from the wider Varty\_SC\_010 sub-catchment (Kelly et al., 2015).

#### 3.2 EPA water quality data (existing data)

The following outlines the available water quality data for the watercourses in context of the proposed project. Only recent water quality (i.e., since 2015) is summarised below.

The Rathnew Stream rises near Glenealy, Co, Wicklow and flows in an easterly direction for approx. 11km before joining the Broad Lough estuary, 1.2km downstream of the survey area. There is a single EPA biological monitoring station on the watercourse. This site (station RS10R020600 in Rathnew) achieved **Q4 (good status)** in 2020. There is no biological water quality monitoring station on the Rossanna Lower Stream.

The Rathnew Stream and Rossanna Stream (both part of the Rathnew Stream\_010 river waterbody) was of poor WFD status and considered 'at risk' in the 2013-2018 period. This was primarily due to urban pressures and domestic wastewater, in addition to agricultural pressures (EPA, 2021).

## 4. Results

The following section summarises the data compiled from the aquatic surveys on the Rossanna Lower Stream and Rathnew Stream. The physical instream characteristics are summarised to support overall value for fish, white-clawed crayfish and macrophyte/aquatic bryophyte communities. The quality of fisheries habitat for both salmonids and lamprey at each survey site is summarised below with further detail provided in **Appendix A**. Biological water quality (Q-sample) results are also summarised for  $n=4$  riverine sampling sites and in **Appendix B**. Habitat codes are according to Fossitt (2000). Scientific names are provided at first mention only. Sites were surveyed on the 9<sup>th</sup> April 2021 during base flow conditions and dry, bright weather. An evaluation of the aquatic ecological importance of each survey site based on these aquatic surveys is provided and summarised in **Table 4.1**.

### 4.1 Aquatic survey site results

#### 4.1.1 Site S1 – Rossanna Lower Stream

Site S1 was situated on the Rossanna Lower Stream, a small 1m wide lowland depositing stream (FW2) situated upstream of the proposed site boundary. The channel was shallow, averaging between 0.1m and 0.2m deep. The stream had been historically straightened but not deepened with low bank heights of 0.3-0.5m high. The profile comprised a mixture of riffle, glide and very localised pool. The stream bed comprised mixed medium and fine gravels with localised cobble and abundant silt. The substrata were heavily bedded with moderate to heavy siltation. The gravels were visible, but the interstitial spaces were blocked with some areas fully covered with silt. The channel supported no macrophytes apart from localised fool's watercress (*Apium nodiflorum*). The riparian zone supported ash (*Fraxinus excelsior*) and hawthorn (*Crataegus monoygna*) with localised elder (*Sambucus nigra*). The understory supported abundant bramble (*Rubus fruticosus* agg.) and ivy (*Hedera hibernica*) with lesser celandine (*Ficaria verna*) and meadow buttercup (*Ranunculus acris*) near the stream margin in addition to localised iris (*Iris psuedacorus*). The channel was bordered by rough pasture. Some fly tipping of rubbish was evident in the stream.

The stream flow was low at the time of survey, and it was not suitable for salmonids. However, the site was considered of some value to brook lamprey (*Lampetra planeri*) albeit the habitat quality was reduced due to compaction of soft sediment areas, which had a high clay fraction. The stream at this site was considered of some low value to European eel which may occur locally in pools. The site was unsuitable for white-clawed crayfish due to an absence of suitable refugia and the shallow nature of the small watercourse. No otter signs were recorded in the vicinity of the survey site and suitability was low.

Biological water quality, based on Q-sampling, was calculated as **Q3-4 (moderate status) (Appendix B)**. No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the absence of good quality of salmonid habitat, the small size of channel and limited aquatic importance overall, the aquatic ecological evaluation of site S1 was of **local importance (lower value) (Table 4.1)**.



**Plate 4.1** Representative image of site S1 on the Rossanna Lower Stream, April 2022

#### 4.1.2 Site S2 – Rossanna Lower Stream

Site S2 was situated on the lower reaches of Rosanna Lower Stream upstream of its confluence with the Rathnew Stream, approx. 280m downstream of site S1. The lowland depositing watercourse (FW2) was narrow and shallow, being 0.5m to 1m wide and between 0.1m and 0.3m deep. The bank heights were 0.5m. The stream had been re-sectioned locally along the field boundary but followed a natural course near its confluence with the Rathnew Stream. The profile was glide dominated with localised riffle. Pool was also present but very localised. The substrata comprised mixed medium and fine gravels with abundant silt and sand. The substrata were heavily bedded with heavy siltation. Gravels were more bedded and more heavily silted than upstream (site S1) with a higher silt loading. The channel did not support macrophytes apart from very localised water parsnip (*Berula erecta*). The riparian zone was open on the western bank and adjoined open semi-improved pasture (GA1) while the eastern bank supported a stock-proof dense hedgerow (WL1) of grey willow (*Salix cinerea*), bramble, gorse (*Ulex europaeus*) and elder.

Although improved compared to upstream, the flows and stream size at site S2 were not considered suitable for salmonids. However, during winter flows some salmonids may enter the stream from the adjoining Rathnew Stream, that was considered a significant salmonid watercourse (see below sections). The site was considered to have good potential for brook lamprey with abundant ammocoete burial habitat present. It also some moderate quality spawning areas featuring medium and fine gravels. The stream at this site was considered of some low value to European eel which may occur locally in pools. The site was unsuitable for white-clawed crayfish due to an absence of suitable refugia and the shallow nature of the small watercourse. No otter signs were recorded in the vicinity of the survey site and suitability was low.



Biological water quality, based on Q-sampling, was calculated as **Q3-4 (moderate status) (Appendix B)**. No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the absence of good quality of salmonid habitat, small size of channel and limited aquatic importance overall, the aquatic ecological evaluation of site S2 was of **local importance (lower value) (Table 4.1)**.



**Plate 4.2** Representative image of site S2 on the Rossanna Lower Stream, April 2022

#### 4.1.3 Site S3 – Rathnew Stream

Site S3 on the Rathnew Stream was a medium sized lowland depositing watercourse (FW2) that was 3-4m wide and between 0.1m and 0.5m deep. The bank heights were 1-1.2m high. The stream had been historically straightened and deepened through agricultural lands but showed good recovery and retained a high degree of naturalness. The stream profile was dominated by deeper glide with localised riffle and pool habitat. Pool habitat was associated with overhanging willow limbs and root systems. The substrata comprised mixed small cobble, coarse and medium gravels with more localised fine gravels. Depositing littorals also supported beds of sand and silt. The substrata were partially bedded with moderate siltation (silt plumes underfoot and deposition in margins). The channel was too shaded to support macrophytes apart from very localised hemlock water dropwort (*Oenanthe crocata*). The riparian zone supported mature willow (*Salix* spp.) on the northern bank with ivy and bramble in the understories, while the southern bank supported semi-improved pasture with scattered gorse scrub (WS1).

The stream at this site was considered an excellent nursery for salmonids due to the presence of abundant well-oxygenated glide and riffle habitat (**Appendix A**). Spawning habitat was also of good



quality throughout, with mixed gravels adjoining deeper glide and pool being abundant. Holding habitat was of good quality locally but improved downstream where the frequency of deep pools increased. The site was also a very good brook lamprey nursery with both spawning areas and soft sediment ammocoete burial areas present. The stream at this location was also considered of good value for European eel given undercut banks with pool and high shading. While the Rathnew Stream had some suitability for white-clawed crayfish none were recorded present. The Rathnew Stream was considered a very good foraging area for otter with two spraint sites recorded in the vicinity of the site. These were recorded on a tyre in the channel (ITM 729084, 695802) and on grey willow limbs (ITM 729064, 695788). Salmonid remains were present in the spraint.

Biological water quality, based on Q-sampling, was calculated tentatively (due to deep glide habitat) as **Q4 (good status) (Appendix B)**. No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the Rathnew Stream had very high fisheries value (i.e. high suitability for lamprey, salmonids and European eel) in addition to supporting an otter population and **Q4 (good status)** water quality, the site was considered of **local importance (higher value) (Table 4.1)**.



**Plate 4.3** Representative image of site S3 on the Rathnew Stream, April 2022

#### 4.1.4 Site S4 - Rathnew Stream

Site S4 on the Rathnew Stream was situated along the north-eastern boundary of the study area, approx. 0.35km downstream of site S3. The Rathnew Stream at this location was a lowland depositing watercourse (FW2) that had been historically deepened but retained a sinuous profile with a well-defined thalweg. The stream was 3.5m-4m wide and between 0.2m and 1.1m deep, being variable due to the mixed profile comprising equal proportions of riffle, pool and glide. The bank heights were between 2m and 2.5m high, exemplifying historical deepening relative to channel width. Pool habitat

was more frequent than upstream due to willow root systems and large woody debris that encouraged erosion on meanders and pool formation. The channel bed supported mixed small cobble, coarse, medium and fine gravels with localised boulder. Depositing littorals supported soft sand and silt (near pools). The substrata were predominantly loose with light to moderate siltation only. The channel supported no macrophytes apart from hemlock water dropwort that was present where light permitted growth in open shallow glide areas. The muddy loam banks supported the liverwort species *Conocephalum conicum* and *Pellia endiviifolia*. The riparian areas supported abundant mature willow (*Salix* spp.) with more occasional alder (*Alnus glutinosa*). The understories supported dense bramble with occasional gorse. The channel was bordered by improved grassland (GA1).

The Rathnew Stream at site S4 was considered a very good quality nursery for salmonids due to the presence of fast-moving glide and riffle with mixed cobbles and gravels (**Appendix A**). It was also a very good spawning area due to mixed gravels adjoining pool. A 0+ Atlantic salmon fry was recorded in a Q-sample confirming the presence of the species within the watercourse (**Plate 4.5**). Holding habitat was of excellent quality due to abundant deep pools with overhanging trees providing cover. The site was also a very good brook lamprey nursery with both spawning areas and ammocoete burial areas present. The channel was also considered of very good value for European eel given undercut banks with deep pool and high shading from overhanging trees. While the Rathnew Stream had some suitability for white-clawed crayfish none were recorded present. The Rathnew Stream was also considered a very good foraging area for otter with a spraint site recorded on a willow limb (ITM 729281, 695914) and a couch site recorded on a moss-covered willow limb (ITM 729278, 695902) in the vicinity of the site (**Plate 4.6**). Salmonid remains were present in the spraint.

Biological water quality, based on Q-sampling, was calculated tentatively (due to deep glide habitat) as **Q4 (good status)** (**Appendix B**). No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the Rathnew Stream had very high fisheries value (i.e. high suitability for lamprey, salmonids and European eel) in addition to supporting an otter population and **Q4 (good status)** water quality, the site was considered of **local importance (higher value)** (**Table 4.1**).





**Plate 4.4** Representative image of site S4 on the Rathnew Stream, April 2022



**Plate 4.5** 0+ Atlantic salmon fry recorded in Q-sample, April 2022 (released back to the Rathnew Stream)





**Plate 4.6** Otter couch on willow limb with very frequently used spraint site

## 4.2 Biological Water Quality

No rare or protected macro-invertebrate species (according to national red lists) were recorded in the biological water quality samples taken from  $n=4$  survey sites sampled for macro-invertebrates on the Rossanna Lower Stream and Rathnew Stream.

Based on a combined assessment of stream condition and also on review of the taxonomic composition of the samples relative to the EPA groups (ranging from clean water indicators to pollution indicators) Q-ratings were determined (as per Toner et al., 2005). Following this approach, the samples collected from the Rossanna Lower Stream achieved **Q3-4 (moderate status)**. The bed of the Rossanna Lower Stream suffered from moderate to heavy siltation at the time of survey. The channel had also been historically realigned and bordered semi-improved grassland that contributed enrichment and siltation pressures (i.e. riparian areas were open along the field boundary with no buffer). Upstream of the study area, suburbanisation pressures (i.e. storm drainage) were evidently impacting the stream. These pressures were reflected in the macro-invertebrate composition that supported only small numbers of clean water indicator mayflies including *Rhithrogena semicolorata* (EPA group A) and *Alainites muticus* (EPA group B) with a dominance of more pollution tolerant group C taxa. The Rossanna Lower Stream also supported the pollution indicator species *Asellus aquaticus* in small numbers. The condition of the stream coupled with the macro-invertebrate composition indicated both sites on the Rossanna Lower Stream were not achieving target **Q4 (good status)** biological water quality and, therefore, did not meet the good status requirements (i.e.,  $\geq Q4$  or EQR equivalent of 0.8) of the Water Framework Directive (2000/60/EC) and the European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 (S.I. No. 77/2019) (**Appendix B**).

The Rathnew Stream, while suffering from some siltation and enrichment pressures, had a much-improved riverbed quality from that observed on the Rossanna Lower Stream. The river, despite being historically deepened, showed very good recovery. The overhanging trees and large woody debris present strongly benefited the river ecology by providing shading and improving local flow velocities and channel heterogeneity. This was reflected in the **Q4 (good status)** water quality recorded at the site. therefore, both sites on the Rathnew Stream met the good status requirements (i.e.,  $\geq Q4$  or EQR equivalent of 0.8) of the Water Framework Directive (2000/60/EC) and the European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 (S.I. No. 77/2019) (**Appendix B**). The invertebrate community supported high numbers of clean water indicator mayflies including *Rhithrogena semicolorata* (EPA group A) and *Alainites muticus* (EPA group B). The Rathnew Stream also supported the cased caddis species *Sericostoma personatum* and *Odontocerum albicorne* (both EPA group B clean water indicators).

### 4.3 Aquatic ecological evaluation

An aquatic ecological evaluation of  $n=4$  survey sites was based on the results of the aquatic and fisheries appraisals and are summarised in **Table 4.1**.

No rare or protected macro-invertebrate species (according to national red lists) were recorded in the biological water quality samples collected from a total of  $n=4$  sites.

No rare macrophytes or rare aquatic bryophytes were recorded during the survey. No examples of the Annex I habitats 'Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation and aquatic mosses [3260]' were recorded at the  $n=4$  survey sites.

The Rossanna Lower Stream at sites S1 and S2 was evaluated as **local importance (lower value)** in terms of aquatic ecology, primarily due to the absence of aquatic species/habitats of high conservation value or Q4 (good status) water quality. The downstream-connecting Rathnew Stream was evaluated as **local importance (higher value)** at sites S3 and S4 primarily due to the high suitability and or confirmed presence fish of conservation value (salmonids, lamprey and European eel), in addition to utilisation by otter and **Q4 (good status)** biological water quality.

**Table 4.1** Aquatic ecological evaluation summary of the aquatic survey sites according to NRA (2009) criteria

Site no.	Watercourse	EPA code	Evaluation of importance	Rationale summary
S1	Rossanna Lower Stream	10R19	Local importance (lower value)	Poor quality salmonid habitat, moderate lamprey & European eel habitat; no suitability for white-clawed crayfish, none recorded; poor suitability for otter, no signs recorded; <b>Q3-4 (moderate status)</b> water quality; no aquatic species or habitats of high conservation value
S2	Rossanna Lower Stream	10R19	Local importance (lower value)	Poor quality salmonid habitat, moderate lamprey & European eel habitat; no suitability for white-clawed crayfish, none recorded; poor suitability for otter, no signs recorded; <b>Q3-4 (moderate status)</b> water quality; no aquatic species or habitats of high conservation value
S3	Rathnew Stream	10R02	<b>Local importance (higher value)</b>	Excellent quality salmonid nursery habitat with good quality spawning and good holding habitat; good quality <i>Lampetra</i> sp. nursery & spawning habitat; good-quality European eel habitat; good suitability for white-clawed crayfish but none recorded; otter signs recorded at the site; <b>Q4 (good status)</b> water quality; no other recorded aquatic species or habitats of high conservation value
S4	Rathnew Stream	10R02	<b>Local importance (higher value)</b>	Good quality salmonid nursery & spawning habitat with good quality holding habitat (0+ Atlantic salmon fry recorded via kick sampling); good quality <i>Lampetra</i> sp. nursery & spawning habitat; good quality European eel habitat; good suitability for white-clawed crayfish but none recorded; otter signs recorded at the site; <b>Q4 (good status)</b> water quality; no other recorded aquatic species or habitats of high conservation value

\* **Conservation value:** Atlantic salmon (*Salmo salar*), sea lamprey (*Petromyzon marinus*), brook lamprey (*Lampetra planeri*), river lamprey (*Lampetra fluviatilis*), white-clawed crayfish (*Austropotamobius pallipes*) and otter (*Lutra lutra*) are listed under Annex II of the Habitats Directive [92/42/EEC]. Atlantic salmon, river lamprey and white-clawed crayfish are also listed under Annex V of the Habitats Directive [92/42/EEC]. European eel are 'critically endangered' according to most recent ICUN red list (Pike et al., 2020) and listed as 'critically engendered' in Ireland (King et al., 2011).

## 5. Discussion

The Rossanna Lower Stream at sites S1 and S2 was evaluated as **local importance (lower value)** in terms of aquatic ecology. This was primarily due to the absence of aquatic species/habitats of high conservation value but also failure of the sites to achieve target Q4 (good status) biological water quality (see **section 5.2** below). Whilst the sites were not considered suitable for salmonids due to low flows and evident siltation pressures, there was, however, some moderate to good suitability for lamprey (*Lampetra* sp.), particularly in terms of soft sediment larval (ammocoete) habitat (**Appendix A**). Overall historical straightening, siltation, enrichment pressures and the clearance of mature trees on the northern and western banks of the stream reduced its ecological value.

The downstream-connecting Rathnew Stream was evaluated as **local importance (higher value)** at sites S3 and S4 given the high suitability for fish of conservation value, namely salmonids (including Atlantic salmon; **Plate 4.5**), lamprey and European eel. The site was also utilised by Annex II otter and achieved Q4 (good status) biological water quality. Site 3 provided excellent quality salmonid nursery habitat with good quality spawning and good holding habitat, in addition to good quality *Lampetra* sp. nursery & spawning habitat (**Appendix A**). There was also good potential for Red-listed (King et al., 2011) European eel in localised deeper pool areas.

Whilst there was some physical suitability in the Rathnew Stream for Annex II white-clawed crayfish, none were recorded during targeted surveys and there are no records for the species in the wider Vartry River catchment (NPWS & NBDC data). The presence of a mature riparian zone with overhanging willow, woody debris and a recovering channel profile (despite historical deepening) on the Rathnew Stream were important features supporting the high ecological value of the river.

## 6. Recommendation

Considering the importance of the Rathnew Stream as a salmonid bearing watercourse with connectivity to Broad Lough an important sea trout estuarine habitat, it is vitally important to preserve the fisheries value of the watercourse. Several high-level recommendations are presented below but do not represent the full suite of measures that would need to be applied to protect watercourses. During the construction phase a CEMP should be formulated to ensure the protection of watercourses in consultation with IFI and the NPWS. This would include control of pollutants at source and monitoring discharges to the adjoining Rossanna and connecting Rathnew Streams. The riparian zone of both watercourses should be strictly protected with a minimum buffer of 15m from the development. This would also help protect identified otter foraging and or resting and breeding habitat. No storm water discharges should be made directly to the Rathnew Stream and rather only to the adjoining Rossanna Lower Stream given its lower ecological value. A drainage plan for the operational phase of the development should be developed with regular maintenance of the drainage system to prevent impacts from storm water pollution to the river system. Consideration of open swale systems and or natural wetland attenuation for storm drainage prior to discharge to the Rossanna Stream are extremely important to curb the threat of stormwater pollution which is one of the primary threats to catchments subject to suburbanisation pressures.



## 7. References

- Byrne, A. W., Moorkens, E. A., Anderson, R., Killeen, I. J., & Regan, E. (2009). Ireland Red List no. 2: non-marine molluscs. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government.
- EA (2003). River Habitat Survey in Britain and Ireland Field Survey Guidance Manual 2003. Environment Agency, UK.
- EPA (2021). 3<sup>rd</sup> Cycle Draft Ovoca-Vartry Catchment Report (HA 10). Catchment Science & Management Unit Environmental Protection Agency. August 2021. Available at: <https://catchments.ie/wp-content/files/catchmentassessments/10%20Ovoca-Vartry%20Catchment%20Summary%20WFD%20Cycle%203.pdf>
- Feeley, H. B., Baars, J. R., Kelly-Quinn, M., & Nelson, B. (2020b). Ireland Red List No. 13: Stoneflies (Plecoptera). National Parks and Wildlife Service.
- Feeley, H. B., Bradley, C., Free, G., Kennedy, B., Little, R., McDonnell, N., ... & Boyle, S. O. (2020a). A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007–2018. *Scientific Data*, 7(1), 1-9.
- Fossitt, J. (2000) A Guide to Habitats in Ireland. The Heritage Council, Ireland.
- Foster, G. N., Nelson, B. H. & O Connor, Á. (2009) Ireland Red List No. 1 – Water beetles. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- Kelly, F.L., Connor, L., Matson, R., Feeney, R., Morrissey, E., Coyne, J. & Rocks, K. (2015). Sampling Fish for the Water Framework Directive, Rivers 2014. Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24, Ireland.
- Kelly-Quinn, M. & Regan, E.C. (2012). Ireland Red List No. 7: Mayflies (Ephemeroptera). National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- Kennedy, G.J.A. (1984). Evaluation of techniques for classifying habitats for juvenile salmon (*Salmo salar* L.) Proceedings of the Atlantic Salmon trust workshop on stock enhancement. 23 pp.
- King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., FitzPatrick, Ú., Gargan, P.G., Kelly, F.L., O'Grady, M.F., Poole, R., Roche, W.K. & Cassidy, D. (2011). Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- Macklin, R., Brazier, B. & Gallagher, C. (2018). Fisheries assessment of selected weir sites on the River Barrow, Counties Carlow & Kilkenny. Unpublished report prepared by Triturus Environmental Services for McCarthy-Keville O' Sullivan on behalf of Waterways Ireland.
- Nelson, B., Ronayne, C. & Thompson, R. (2011). Ireland Red List No.6: Damselflies & Dragonflies (Odonata). National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.
- NRA (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes. Revision 2, 1st June 2009. National Roads Authority, Dublin.



O'Connor, L. & Kennedy, R.J (2002). A comparison of catchment-based salmon habitat survey techniques on three rivers in N. Ireland. *Fisheries Management and Ecology*, 9, 149-161.

Pike, C., Crook, V. & Gollock, M. (2020). *Anguilla anguilla*. The IUCN Red List of Threatened Species 2020: e.T60344A152845178. <https://dx.doi.org/10.2305/IUCN.UK.20202.RLTS.T60344A152845178.en>

Toner, P., Bowman, J., Clabby, K., Lucey, J., McGarrigle, M., Concannon, C., ... & MacGarthaigh, M. (2005). Water quality in Ireland. Environmental Protection Agency, Co. Wexford, Ireland.

RECEIVED: 14/05/2023

## 8. Appendix A – fisheries habitat

RECEIVED: 14/08/2023

RECEIVED: 14/08/2023

**Table 8.1** Life Cycle Unit scores for salmonid habitat at the  $n=4$  survey sites (lower scores = superior habitat)

Site	Watercourse	Spawning	Nursery	Holding	Total score	Salmonid habitat value	Salmonids recorded
S1	Rossanna Lower Stream	4	4	4	<b>12</b>	Poor	Not observed
S2	Rossanna Lower Stream	4	4	4	<b>12</b>	Poor	No observed
S3	Rathnew Stream	1	1	2	<b>4</b>	Excellent	Yes, seen present
S4	Rathnew Stream	2	2	1	<b>5</b>	Excellent	Yes, seen present; 0+ Atlantic salmon recorded via kick sampling

**Table 8.2** Lamprey Habitat Quality Index (LHQI) scores for lamprey habitat at the  $n=4$  survey sites (lower scores = superior habitat)

Site	Watercourse	Spawning	Nursery	Total score	Lamprey habitat value	Lamprey recorded
S1	Rossanna Lower Stream	3	3	<b>6</b>	Moderate	Not recorded but some low suitability
S2	Rossanna Lower Stream	3	2	<b>5</b>	Good	Good nursery habitat in soft sediment deposits
S3	Rathnew Stream	2	2	<b>4</b>	Good	Not observed but good suitability
S4	Rathnew Stream	2	2	<b>4</b>	Good	Not observed but good suitability

## 9. Appendix B – Q-sample results (biological water quality)

RECEIVED: 14/08/2023

RECEIVED: 14/08/2023

**Table 8.1** Macro-invertebrate Q-sampling results for aquatic survey sites S1, S2, S3 & S4

Group	Family	Species	Rossanna Lower Stream		Rathnew Stream		EPA group
			S1	S2	S3	S4	
Ephemeroptera	Heptageniidae	<i>Rhithrogena semicolorata</i>	3	4	39	44	A
Ephemeroptera	Baetidae	<i>Alainites muticus</i>	1	2	18	12	B
Trichoptera	Limnephilidae	<i>Potamophylax cingulatus</i>	2				B
Trichoptera	Limnephilidae	<i>Limnephilus</i> sp.		1		1	B
Trichoptera	Odontoceridae	<i>Odontocerum albicorne</i>			1		B
Trichoptera	Sericostomatidae	<i>Sericostoma personatum</i>	5	10	1	1	B
Ephemeroptera	Baetidae	<i>Baetis rhodani</i>	26	35	19	11	C
Ephemeroptera	Ephemerellidae	<i>Serratella ignita</i>	1	1	2	4	C
Trichoptera	Hydropsychidae	<i>Hydropsyche instabilis</i>	4	2	6	17	C
Trichoptera	Hydropsychidae	<i>Hydropsyche siltalai</i>	2	1		6	C
Trichoptera	Polycentropodidae	<i>Plectrocnemia conspersa</i>		1			C
Trichoptera	Psychomyiidae	<i>Metalype fragilis</i>			1		C
Trichoptera	Rhyacophilidae	<i>Rhyacophila dorsalis</i>				1	C
Mollusca	Lymnaeidae	<i>Radix baltica</i>	1				C
Coleoptera	Elmidae	<i>Limnius volckmari larva</i>			4	4	C
Coleoptera	Hydraenidae	<i>Hydraena gracilis</i>				1	C
Diptera	Chironomidae	Non- <i>Chironomus</i> spp.	34	7	3	5	C
Diptera	Pediciidae	<i>Dicranota</i> sp.	8		12	40	C
Diptera	Pediciidae	<i>Pedicia</i> sp.	3	2			C
Crustacea	Gammaridae	<i>Gammarus duebeni</i>	11	36	5	8	C
Arachnida	Hydrachnidiae	Unidentified species	3			1	C
Mollusca	Tateidae	<i>Potamopyrgus antipodarum</i>	36	48	13	5	D
Hirudinidae	Erpobdellidae	<i>Erpobdella</i> sp.	2				D
Crustacea	Asellidae	<i>Asellus aquaticus</i>	4	2			D

Group	Family	Species	Rossanna Lower Stream		Rathnew Stream		EPA group
			S1	S2	S3	S4	
Diptera	Chironomidae	<i>Chironomus spp.</i>	3				E
Nematomorpha	Gordiidae	Unidentified species	1			1	n/a
Annelidae	Oligochaeta	Unidentified species	7	1			n/a
Abundance			157	153	124	162	
Q-rating			Q3-4	Q3-4	Q4	Q4	
WFD status			Mod	Mod	Good	Good	

RECEIVED: 14/08/2023



RECEIVED: 14/08/2023



Triturus Environmental Ltd.

42 Norwood Court,

Rochestown,

Co. Cork,

T12 ECF3.