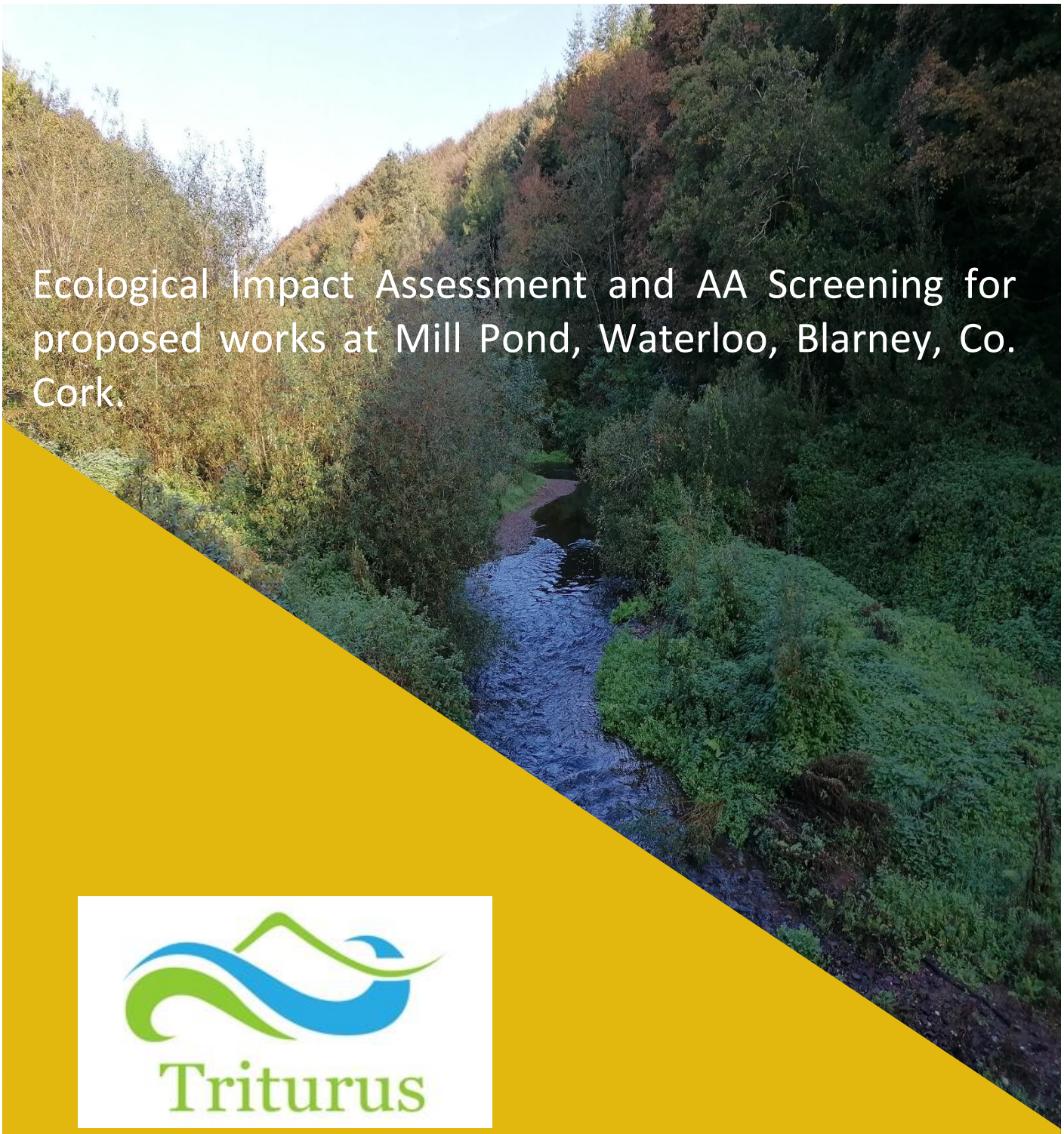

Ecological Impact Assessment and AA Screening for proposed works at Mill Pond, Waterloo, Blarney, Co. Cork.

Triturus

Limosa Environmental
ecological & environmental consultancy

October 2020

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A (Draft for comment)	RP20-GW167-11	R Macklin L. J. Lewis	LJL/RM	16th October 2020
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1. Introduction

Triturus Environmental Limited was commissioned to undertake Ecological Impact Assessment and provide information to enable Appropriate Assessment Screening in relation to proposed works at Mill Pond, Waterloo, Blarney, Co. Cork.

The aims of Ecological Impact Assessment (EcIA) are to:

- Establish the ecological baseline for the subject lands,
- Determine the ecological value of the identified ecological features,
- Assess the impacts of the proposed development on important ecological features,
- Recommend mitigation measures to avoid or minimise any identified ecological impacts,
- Identify any residual impacts of the development post-mitigation.

The obligation to undertake Appropriate Assessment arises from Articles 6 (3) and (4) of European Union (EU) Council Directive 92/43/EEC (Habitats Directive) and transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations S.I. No 477 of 2011. Screening is the first stage of an Appropriate Assessment (AA) and aims to establish whether a proposed plan or project (in this case a project) either alone or in combination with other plans or projects, could have significant negative effects on a Natura 2000 site in view of the site's conservation objectives. At Stage 2 (Appropriate Assessment), the impact of a project or plan alone and in combination with other projects or plans on the integrity of the Natura 2000 site is considered with respect to the conservation objectives of the site and to its structure and function (DoEHLG, 2009).

Natura 2000 sites are Special Areas of Conservation (SACs) designated under the EU Habitats Directive,[1] and Special Protection Areas (SPAs), designated under the EU Birds Directive.[2] As signatories to these Directives, Ireland like other EU Member states, has designated prime areas of ecological importance as SACs and SPAs and these are part of a network of sites of 'community importance' for biodiversity across the EU called the 'Natura 2000' network.

The proposed project lies on the River Martin, a tributary of the River Shournagh, which in turn is a tributary of the River Lee which flows into Cork Harbour. Cork Harbour is afforded two designations for nature conservation, namely, Cork Harbour Special Protection Area (SPA 4030) and Great Island Channel Special Area of Conservation (SAC 1058). On account of the proposed projects' location in relation to Natura 2000 sites, and in accordance with legislative requirements (Articles 6 (3) and (4) of European Union (EU) Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora[3], a *Habitats Directive Screening Statement* was prepared to assess the potential for impacts upon the Natura 2000 sites. The screening report is attached in Appendix A of this document.

[1] Council Directive 92/43/EEC on the conservation of natural habitats and wild flora and fauna, as amended by Council Directive 97/62/EC. The Directive was transposed into Irish law by the European Communities (Natural Habitats) Regulations, SI 94/1997 which were amended and later consolidated by the European Communities (Birds and Natural Habitats) Regulations 2011 – 2015 (S.I. 355/2015).

[2] Directive 2009/147/EC (Birds Directive) on the conservation of wild birds (the codified version of Council Directive 79/409/EEC as amended).

[3] implemented in Ireland through the European Communities (Natural Habitats) Regulations of 1997)

1.1. Site location

The site of the proposed project is Mill Pond, Blarney, Co. Cork (Grid Ref: W 61135 77070) (Figure 1a below). The River Martin is located immediately adjacent (east) of Mill Pond. The river flows in a north to south direction towards Blarney and then turns westwards just south of Blarney centre to join the Shournagh River. The Shournagh River is a tributary of the River Lee which enters the sea at Cork Harbour. Mill Pond is accessed by Waterloo Road to the east. To the east and west of Mill Pond the surrounding landscape is largely broadleaved woodland.

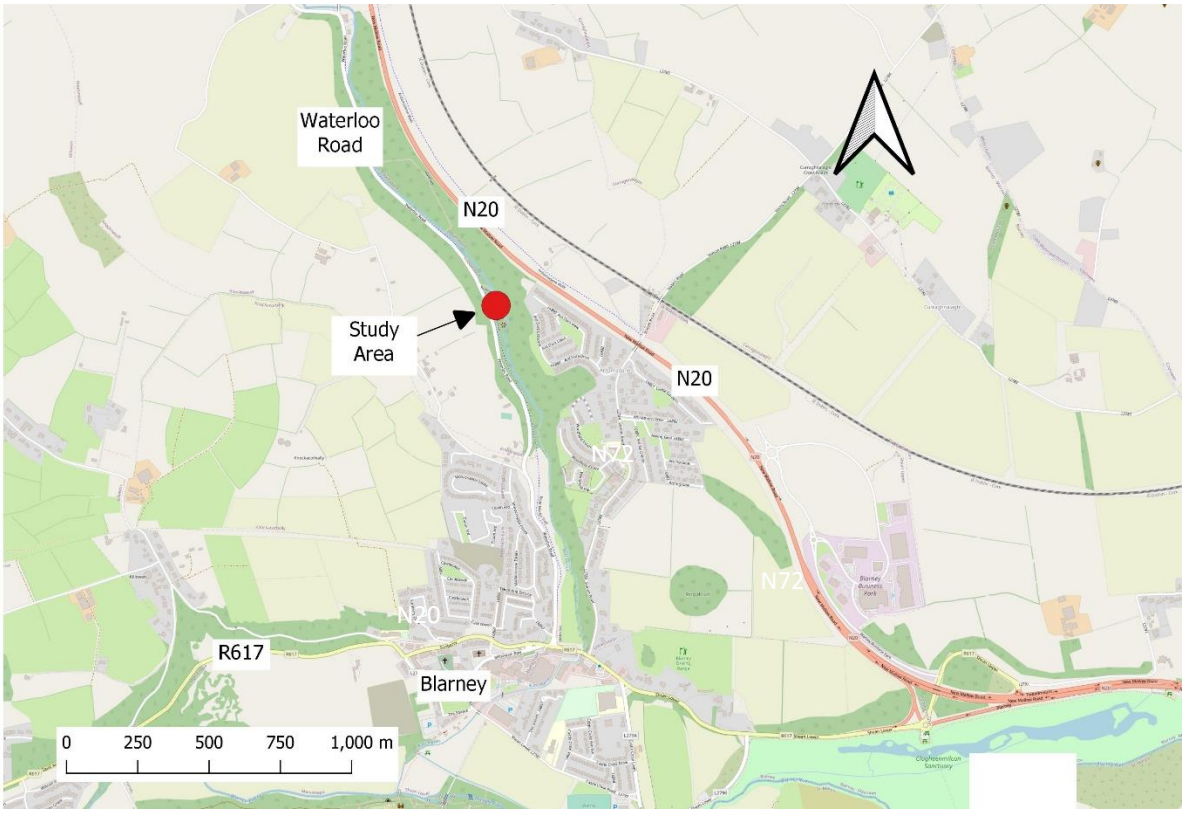

Figure 1a. Location of proposed study area

1.2. Project details

Project description

Bank stabilisation works and riverside path repairs are required at Mill Pond, Waterloo Road, Blarney, Co. Cork over circa. 100m of riverbank (Figure 1b below). Currently large sections of the banks have been eroded from the river with collapse of historical boulder bank reinforcements and earth into the River Martin. This has encouraged further scouring out of the banks and further erosion of a pathway between the Mill Pond and the river. The Waterloo community group wish to rehabilitate the banks to reinstate them in order to restore the river walkway. The works will also include the reinstatement of the path and wooden fence line that exists between the Pond and the River Martin.

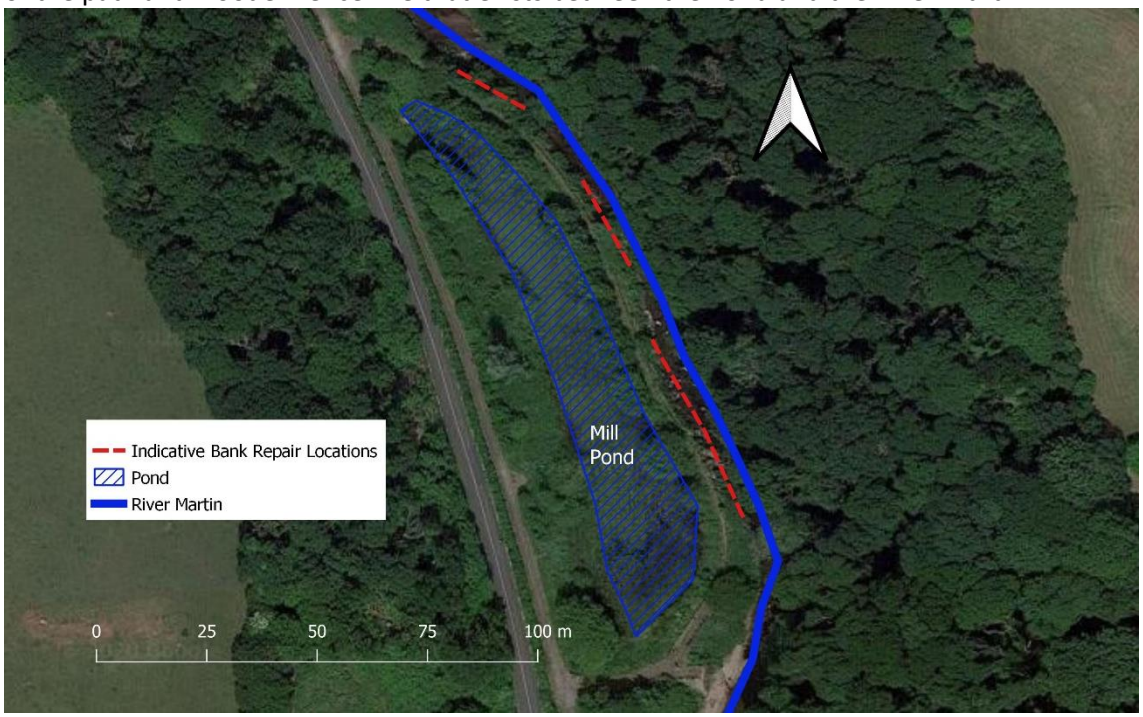

Figure 1b. Indicative location of bank repair works at the Mill Pond adjoining the River Martin

Project details

In order to rehabilitate the riverbanks, it is proposed to excavate down to a maximum of 500mm below the existing river bed. This will occur in the footprint of the existing riverside embankment to create a base to facilitate the construction of the sandstone rock armouring (using sandstone flag). This will involve the placement of 300mm of 35N concrete and the construction of a sandstone rock armour bank with concrete backing, creating a mass retaining structure with geo membrane to mitigate against leaching (see Figure 1c below).

By utilising large flagstone blocks rather than traditional boulder rock armouring the extent of incursion into the River Martin can be minimising by reducing the slope of the embankment. There will have to be access by machinery from the river to facilitate construction of the new embankments given the steepness of the existing riverbanks. There is also limited scope to carry out works from the existing pathway between the Mill Pond and the River Martin. An excavator machine will need to work from the River Martin at each of the three bankside works areas. To facilitate working in the dry, 1 tonne sand bags will be lined along the bank and wrapped with 1200 gauge plastic to form a water barrier. The over-pumped water will then be discharged downstream to the River Martin following

siltation treatment. This will include the use of silt buster units, silt bags and other siltation control devices to minimise silt escapement.

Once the banks are reinstated, a gravel pathway will be installed, and a wooden fence constructed. Any trees removed from the riverbank (i.e. root zones overlapping works) will be replanted to regenerate riparian cover following construction completion.

A temporary works design will be developed by the appointed contractor and agreed with Inland Fisheries Ireland in advance of construction commencement.

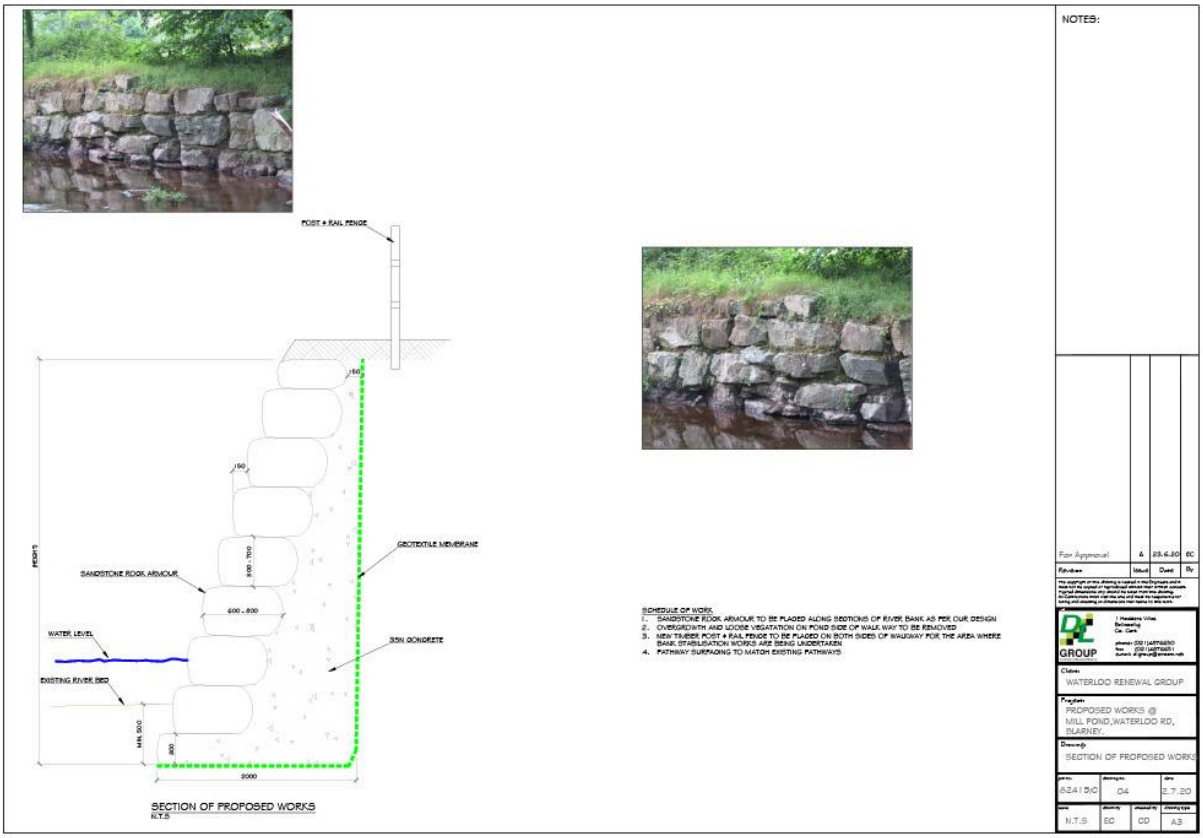

Figure 1c. Indicative proposals for bank reinforcement works showing sandstone rock armour design (DL Group)

2. Methodology

2.1 Ecological Impact Assessment

Ecological Impact Assessment (EcIA) process has four main steps:

1. Ecological evaluation – this step consists of evaluating each ecological resource (e.g. habitat, population, or species) within the zone of influence (area to be affected) using the criteria outlined in Table 1a (based on a geographic hierarchy of importance). Each ecological resource, following survey and assessment, is given an evaluation value (ranking) as described in Table 1b.
2. Impact (Affect) prediction - based on information provided on the proposed project/development, this step aims to identify all direct and indirect impacts that may affect the ecological features in the zone of influence, and wider area. Table 1c gives impact terminology as per the EPA (2017).
3. Assessment of the magnitude of impact - impact magnitude refers to the 'size' or 'amount' of an impact/ affect (IEEM, 2006; EPA, 2017). The magnitude of an impact will depend on the nature and sensitivity of the ecological features and will be influenced by intensity, duration (temporary/permanent), timing, frequency and reversibility of the potential impact (CIEEM 2016). Levels of impact magnitude are given in Table 1d. Magnitude terminology is based on EPA (2003) while the rationale for assigning level of significant impact follows CIEEM (2016). Importantly, this step aims to identify the impacts which may be significant upon '*important ecological features'* (CIEEM, 2016).
4. Design of mitigation measures – mitigation measures should be designed to avoid or minimise negative adverse impacts upon *important ecological features.*

Table 1a. Criteria for ecological evaluation

Evaluation criteria	Definitions and Notes
Site designations	Designated areas for conservation are areas that are designated under national and/or European laws in order to conserve habitats and species of national or international conservation importance. These include: • Natural Heritage Areas (NHA): a national designation given legal status by the Wildlife Amendment (2000) Act. • Special Areas of Conservation (SAC): areas considered of European and national importance whose legal basis is the EU Habitats Directive (92/43/EEC), transposed into Irish law through the European Union (Natural Habitats) Regulations, 1997. • Special Protection Areas (SPA): sites of conservation importance for birds whose legal basis is the EU Birds Directive (209/147/EC). • Wildfowl Sanctuary: designated under the 1976 Wildlife Act. • Ramsar Site: European designation based on the Ramsar Convention, 1984.
Species designations/criteria	Certain legislation refers directly to species/populations (e.g. annexed species):

	• Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora. • Council Directive 79/409/EEC on the Conservation of Wild Birds ('Birds Directive'). • Bern Convention on the Conservation of European Wildlife and Natural Habitats. • The Wildlife Act (1976) and the Wildlife (Amendment) Act (2000). • Birds of Conservation Concern in Ireland (Colhoun & Cummins, 2013). • Red Data Books (e.g. Wyse-Jackson et al. 2016) • Flora (Protection) Order, 2015.
Size	Includes both size of habitats (area) and population size of individual species and is intrinsically linked to other criteria such as rarity and fragility (below). Habitats: considers minimum viable size of habitats, habitat heterogeneity, species/area relationships, home-range size. Populations: considers concept of minimum viable population size (population viability), national and local population trends, and extinction risk.
Diversity / Biodiversity	At a minimum species richness (number of species). Biodiversity defined as 'the variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part (Convention on Biological Diversity, 1993). Must be considered in terms of the habitat type - some habitats have low species diversity by nature. Keystone species deserve special attention – defined as a species whose removal would induce significant changes within the food web (Begon *et al.,* 1996).
Rarity	Applies to habitats and to species. The degree to which a habitat or community approximates a natural state. The degree to which the site is a good example of the habitat types. National, county, local scales e.g. within 10-km^2 squares.
Naturalness	The degree of modification by human intervention. Habitats that are least modified are generally regarded more highly (Treweek, 1999). Also considers the extent to which the habitat is free of alien species.
Representativeness/ Typicalness	How well the area represents habitats or vegetation types on a wider scale (Treweek, 1999); 'degree of representivity of the natural habitat type on the area' (Council Directive 92/43/EEC; Habitats Directive).
Fragility	The degree of sensitivity of habitats, communities and species to environmental change.
Stability/Resistance/Resilience	Habitats and species. Stability refers to the ability of an ecosystem to maintain some form of equilibrium in the presence of a disturbance. Resilience is defined as the ability and speed with which a community returns to its former state following a disturbance. Resistance is defined as the ability of a community to avoid displacement by a disturbance (Begon *et al.,* 1996).
Other criteria include:	
Recorded history (scientific value), Potential value, Educational value, Amenity value.	

Table 1b. Ecological Evaluation

Ecological value	Examples
A International	Sites designated as Special Protection Areas (SPA), Special Areas of Conservation (SAC), Ramsar Sites. Sites meeting criteria for international designation.
B National	Sites designated as Natural Heritage Areas (NHA) or sites qualifying for designation. Undesignated sites containing good examples of Annex I habitats. Undesignated sites containing significant numbers of resident or regularly occurring populations of Annex II species under the EU Habitats Directive or Annex I species under the EU Birds Directive or species protected under the Wildlife (Amendment) Act 2000. Sites supporting viable populations of Red Data Book species (nationally rare species).
C Regional	Undesignated sites that are prime examples of the habitat (natural or semi-natural) type, exhibit high biodiversity or support important communities/assemblages of species within the region. Sites exhibiting habitats that are scarce within the region. Sites that support nationally scarce plant species (recorded from less than 65 10-km^2 squares, unless they are locally abundant). Sites that hold regionally scarce vertebrate species.
D High Local	Sites that are prime examples of the habitat type, exhibit high biodiversity or important communities/assemblages of species within the local area. Habitats that are considered important in a local context – e.g. semi-natural habitats within an urban setting, hedgerows and treelines that serve as important ecological corridors within an otherwise modified landscape. Sites exhibiting habitats/species that are generally scarce within the local area.
E Moderate Local	Sites that exhibit good quality semi-natural habitats. Hedgerows and treelines.
F Low Local	Artificial or modified habitats considered of low value for wildlife.

Table 1c. Description of effects as per the EPA (2017)

Positive Impact	A change which improves the quality of the environment.
Negative Impact	A change which reduces the quality of the environment.
Neutral Impact	A change that falls within typical bounds of variation within the study area.
Indirect Effects/ Secondary Effects	Impacts not directly associated with the project, often produced away from the project site or because of a complex pathway.
Cumulative Effects	The addition of many small impacts to create one larger, more significant, impact.
Do-Nothing Effects	The environment as it would be in the future if no development was carried out.
Worst-Case Effects	Impacts arising from a development in the case where mitigation measures substantially fail.
Indeterminable Effects	When the full consequences of a change in the environment cannot be described.
Irreversible Effects	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
Residual Effects	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
Synergistic Effects	Where the resultant impact is of greater significance than the sum of its constituents.

Table 1d. Significance of Effects (terminology based on EPA 2017; CIEEM 2016).

Impact Magnitude	Definition / Rationale
Imperceptible	An effect capable of measurement but without noticeable consequences.
Not Significant	An effect that causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect that has noticeable consequences without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	A significant effect is one which undermines the conservation objectives for '**important ecological features'** (CIEEM, 2016). In broad terms, significant effects encompass impacts upon the structure and function of a defined site, its habitats and species and their conservation status; or in other words on site integrity**. The EPA (2017) measure these effects as those that significantly alter a sensitive aspect of the environment.
Very Significant Effects	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect that obliterates sensitive characteristics.

** Integrity is defined as 'the integrity of a site is the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified.

Table 1e. Quality of Effects (terminology based on EPA, 2017)

Impact Magnitude	Definition / Rationale
Positive Effects	A change which improves the quality of the environment (e.g. increasing species diversity, improving reproduction capacity or by removing nuisances).
Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative Adverse Effects	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; damaging health or property or by causing nuisance).

2.2 Appropriate Assessment

There are 4 stages in an Appropriate Assessment as outlined in the European Commission Guidance document (EU Commission, 2001). The following is a brief summary of these steps.

Stage 1 - Screening: This stage examines the likely effects of a project/plan either alone or in combination with other projects/plan upon a Natura 2000 site and considers whether it can be objectively concluded that these effects will not be significant. The assessment of significance is carried out in consultation with the relevant nature conservation agencies.

Table 2. Steps for the undertaking of AA Screening

Step One	*Determination of whether the plan or project is directly connected with the necessary management of the Natura 2000 site.*
Step Two	*Description of the proposed project/plan and the description of other plans/projects that in combination have the potential to have significant effects on a Natura 2000 site.*
Step Three	*Characteristics of the site. Identification of relevant Natura 2000 sites, and compilation of information on their qualifying interests and conservation objectives. Identification of the potential effects upon a Natura 2000 site and characterisation of the site as a whole to identify where impacts are most likely to fall.*
Step Four	*Assessment of the significance of effects on the Natura 2000 site.* *If the effects are deemed to be significant then the process must pass to Stage 2 – Appropriate Assessment.*

Stage 2 - Appropriate Assessment: In this stage, the impact of the project on the integrity of the Natura 2000 site is considered with respect to the conservation objectives in place for site.

Stage 3 - Assessment of Alternative Solutions: Should the Appropriate Assessment determine that adverse impacts are likely upon a Natura 2000 site, this stage examines alternative ways of implementing the project that, where possible, avoid these adverse impacts.

In the absence of any reasonable alternatives for a project/plan that would be less damaging to the integrity of a Natura 2000 site, it is then necessary to proceed to Stage 4.

Stage 4 - Where imperative reasons of overriding public interest (IROPI) exist, an assessment to consider whether compensatory measures will or will not effectively offset the damage to the Natura site will be necessary.

Methodological guidance for Appropriate Assessment is provided in the following documents:

- *Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (EU Commission, 2001),
- *'Appropriate Assessment of plans and projects in Ireland: Guidance for planning authorities* (DoEHLG, 2009).

The statutory agency responsible for designated areas in Ireland is the National Parks & Wildlife Service of the Department of Culture, Heritage and the Gaeltacht.

2.3 Assessment methodology

- **Identification of Natura 2000 sites**

The proximity of proposed development sites to Natura 2000 sites is of importance when identifying potential impacts. There is no set or standard distance, rather the zone of influence, i.e. the area over which impacts can occur, varies from project to project based on a range of factors including development type, scale, size and location. Irish guidance (DoEHLG, 2009) states '*For projects, the distance could be much less than 15 km, and in some cases less than 100m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects*.' In the case of the current proposed development and considering all factors, Natura 2000 sites within a 10km radius of the proposed site were identified and considered during the assessment.

- **Desk top Study**

Sources of information included the following:

- Online data held by the National Parks and Wildlife Service (NPWS) (www.npws.ie) including locations and boundaries of Natura 2000 sites,
- Online data of the National Biodiversity Data Centre (www.nbdc.ie),
- Cork County Biodiversity Action Plan (Cork County Council, 2009),
- County Cork Development Plan (Cork County Council, 2014, 2014b).

- **Site surveys**

Habitats - A terrestrial habitat survey was carried out on the 19th June 2020. Habitats within the proposed site were identified, classified and mapped according to *'A guide to habitats in Ireland'* (Fossitt, 2000). Particular attention was directed at identifying the presence of Invasive Alien Species (IAS).

The conservation status of habitats and flora was considered. The conservation status of habitats and flora within Ireland and Europe is indicated by inclusion in one or more of the following:

- Irish Red Data Book for Vascular Plants (Wyse Jackson et al. 2016),
- Flora Protection Order (1999; as amended (2015),
- The EU Habitats Directive (92/43/EEC).

Birds – The site was visited on two occasions - the 29th May 2020 (0745-0900 hours and the 19th June 2020 (0650-0730hrs). Terrestrial birds are often surveyed following standard methodology adopted by the Countryside Bird Survey (e.g. Coombes et al. 2009). However, this methodology is best suited to birds of the open countryside where linear transects are walked and birds are recorded in distance bands away from the observer. The study site comprised Mill Pond and the adjacent River Martin. These aquatic habitats are bounded largely by woodland. To obtain an adequate account of the avian diversity and abundance of the study area, a two-part methodology was therefore used. Firstly, the observer (LJL) walked a 'transect' route along the narrow pathway between the pond and the river, and recorded birds in distance bands of 0-50m, 50-100m, and 100M+. Secondly, a 30-minute point count was undertaken at a vantage point at the south overlooking the pond. During both surveys, all bird species seen and heard were recorded onto a field map (aerial photo) using the species code (two letter system developed by the British Trust for Ornithology (BTO)). The habitat that each bird was located within was recorded. Breeding evidence was recorded where possible using the standard system of the British Trust for Ornithology (BTO) as shown in Appendix 1. Birds flying over and obviously not interacting with the site were recorded separately. Photographs were taken to record features of note. Key results provided are:

- Breeding status recorded as: PR = probable breeding, PO = possible breeding, NB = non-breeding, CB = confirmed breeding),
- The species' status (**R**esident, **F**eral (released), **W**inter migrant, **S**ummer migrant) and an indication of conservation concern in Ireland (BoCCI, **R**ed or **A**mber-listed) (Colhoun & Cummins, 2013). Annex I bird species are also identified,
- Watercourse specialists (e.g. Dipper *Cinclus cinclus*) are identified and highlighted to distinguish from generalist species,
- The current status and trends of the bird species recorded were assessed and rare, sensitive or particularly vulnerable species are highlighted.

Aquatic & Fisheries – Aquatic site survey visits were conducted on the 26th July 2020 during base flow conditions. The survey was carried out by Ross Macklin (Triturus Environmental Ltd). The survey included an assessment of survey sites as follows (refer to Figure 1a. below):

- Site 1A (River Martin) - situated between the meander at the upstream extent of the works to 50m downstream.
- Site 1B (River Martin) - situated in the central point of the works area.
- Site 1C (River Martin) – Lower extent of the works area where largest proportion of bank works is proposed.
- Mill Pond Site 2 – Small artificial pond adjoining the riverside loop walk

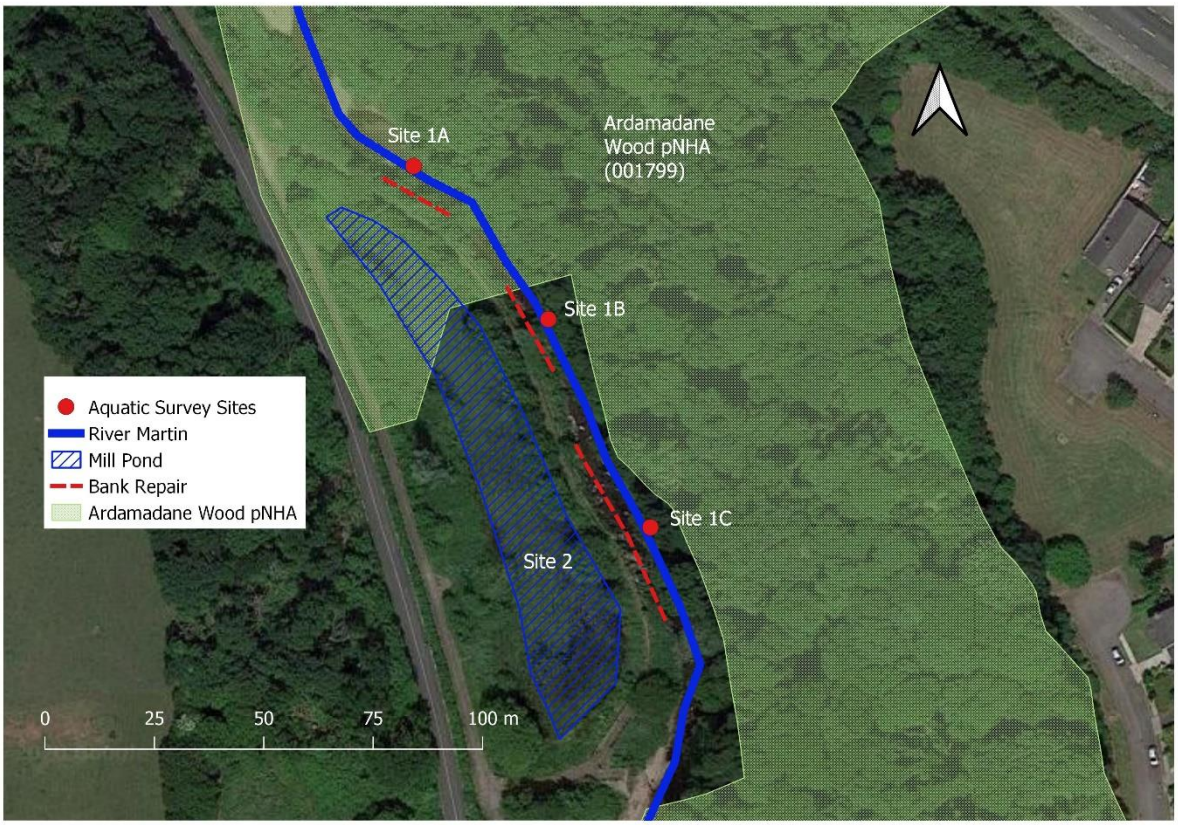

Figure 2. Location of aquatic survey areas (*Source: Google maps*).

Surveys at each aquatic site included a fisheries habitat appraisal and biological water quality sampling (Q-sampling). Signs of rare, protected and/or conservation interest aquatic species such as Otter (*lutra lutra*) were also searched for at each survey site. This holistic approach informed the overall aquatic ecological evaluation of each site in context of the proposed development. A broad aquatic habitat assessment was conducted at each site 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:

- Channel width and depth and other physical characteristics
- Substrate type, listing substrate fractions in order of dominance, i.e. bedrock, boulder, cobble, gravel, sand, silt etc,
- Flow type, listing percentage riffle, glide and pool,
- In-stream macrophyte, bryophytes occurring and their percentage coverage of the stream bottom at the sampling sites,
- Riparian vegetation composition

Mammals - the habitat and aquatic surveys recorded signs of mammals where present. Signs of a mammal is more often observed rather than the animal itself, therefore the site was inspected for evidence of mammal being present such as droppings, foraging signs, burrows, hair etc. Particular attention was given to the potential for Otter with regards the habitats onsite (i.e. the River Martin and Mill Pond) within the study area. The River Martin was waded for 150m upstream and downstream of the development boundary to record all signs (i.e. holts, couches, slides, spraint etc.). The methodology followed broadly that of Macklin et al. 2019 using the '*total corridor otter survey*' approach.

Bats – An appraisal of trees and or structures often bat roost suitability was undertaken during the site visit. This ensured that any likely bat roost areas could be identified.

2.4 Reporting

Assessment and reporting were undertaken with regards to the following documents:

- Guidelines on the information to be contained in Environmental Impact Statements (EPA, 2017),
- Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland (Chartered Institute of Ecology and Environmental Assessment (CIEEM, 2016),
- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (EU Commission (2001),
- Appropriate Assessment of plans and projects in Ireland: Guidance for planning authorities (DoEHLG, 2009),
- Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC; (EU Commission, 2000).

Ecological Impact assessment was carried out following the methodology detailed in Section 2.1 and impact terminology follows EPA (2017). Where mentioned in the report, habitat classification follows '*A Guide to Habitats within Ireland*' (Fossitt, 2000). A statement of competency for the authors of this report is provided in Appendix 2.

3.0 Description of the proposed project

4.0 Baseline environment

4.1 Designated sites for nature conservation

Natura 2000 sites

Natura 2000 sites comprise Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). They form part of a European-wide ecological network of sites hosting the natural habitat types listed in Annex I and species listed in Annex II of the EU Habitats Directive (SACs), and areas designated for the protection of bird species listed on Annex I, regularly occurring populations of migratory species (e.g. ducks, geese or waders), and wetland of international importance, under the EU Bird's Directive. The aim of the network is to aid the long-term survival of Europe's most valuable and threatened species and habitats. There are no Natura 2000 sites within a 10km radius of the proposed development site (Figure 3).

Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs)

Natural Heritage Areas (NHAs) are designations under the Wildlife Acts 1976 & 2000 that aim to protect habitats, species or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with Natura 2000 sites. In addition to formally designated NHAs, there are about 630 proposed NHAs (pNHAs) which were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. These are afforded the same full protection as NHAs.

Within a 10km radius of the proposed site there are eight pNHAs (Figure 4). The eight pNHAs within a 10km radius are as follows:

Ardamadane Wood (pNHA 001799)
Ardamadane Wood is located north of Blarney village, 6km north-west of Cork City. It is situated along the banks of the River Martin and the proposed site **is therefore located within this pNHA** (refer to Figure 5 below).

Lee Valley (pNHA 000094)
This site occupies five separate sections of the valley of the River Lee, immediately to the west of Cork City. A diverse range of semi-natural habitats occurs including wet broadleaved woodland, dry broadleaved woodland, wet grassland, dry grassland and freshwater marsh. The River Martin joins the larger Shournagh River just south of Blarney and the Shournagh River is a tributary of the River Lee. Hence there is connectivity between the proposed development site and this pNHA.

Shournagh valley (pNHA 000103)
This site includes two lower sections of the Shournagh River c. 8km west of Cork City. The Shournagh River flows south-east to join the River Lee which then flows through the City. Proposed for designation largely for woodland habitat, this site is ecologically connected to the proposed development site for the same reasons as the River Lee described above.

Blarney Castle Woods (pNHA 001039)
This site is situated 1km south-west of Blarney in the grounds of Blarney Castle. The wood is bounded to the north by the Blarney River and to the south by the parklands surrounding the castle.

Cork Lough (pNHA 001081)
This small lake is situated in the north-west of Cork City, 1km north of the River Lee.

Ballincollig Cave (pNHA 001249)
Ballincollig Castle and cave are located at Ballincollig, a satellite town of Cork City. Based on limestone the site hosts some important uncommon and native plants.

Blarney Lake (pNHA 001798)
Blarney lake is situated 1km south west of Blarney, close to Blarney Castle. The lake is of artificial origin and is surrounded by a narrow band of woodland predominantly oak (*Quercus* spp.), Beech (*Fagus sylvatica*) and fir (*Abies* spp.).

Blarney Bog (pNHA 001857)
Blarney Bog is a small area of Reed Canary-grass (*Phalaris arundinacea*) fen, situated in the flat valley floor of the River Blarney. It is located 0.5km west of Blarney Town and 4.5km north-west of Cork City.

Figure 3. Natura 2000 sites in close proximity but greater than 10km from the proposed site near Blarney (pale yellow shading equates to Cork Harbour SPA, while blue hatching is Great Island Channel SAC). Red circle shows a circle of 10km radius, while the red dot is centred on Mill Pond.

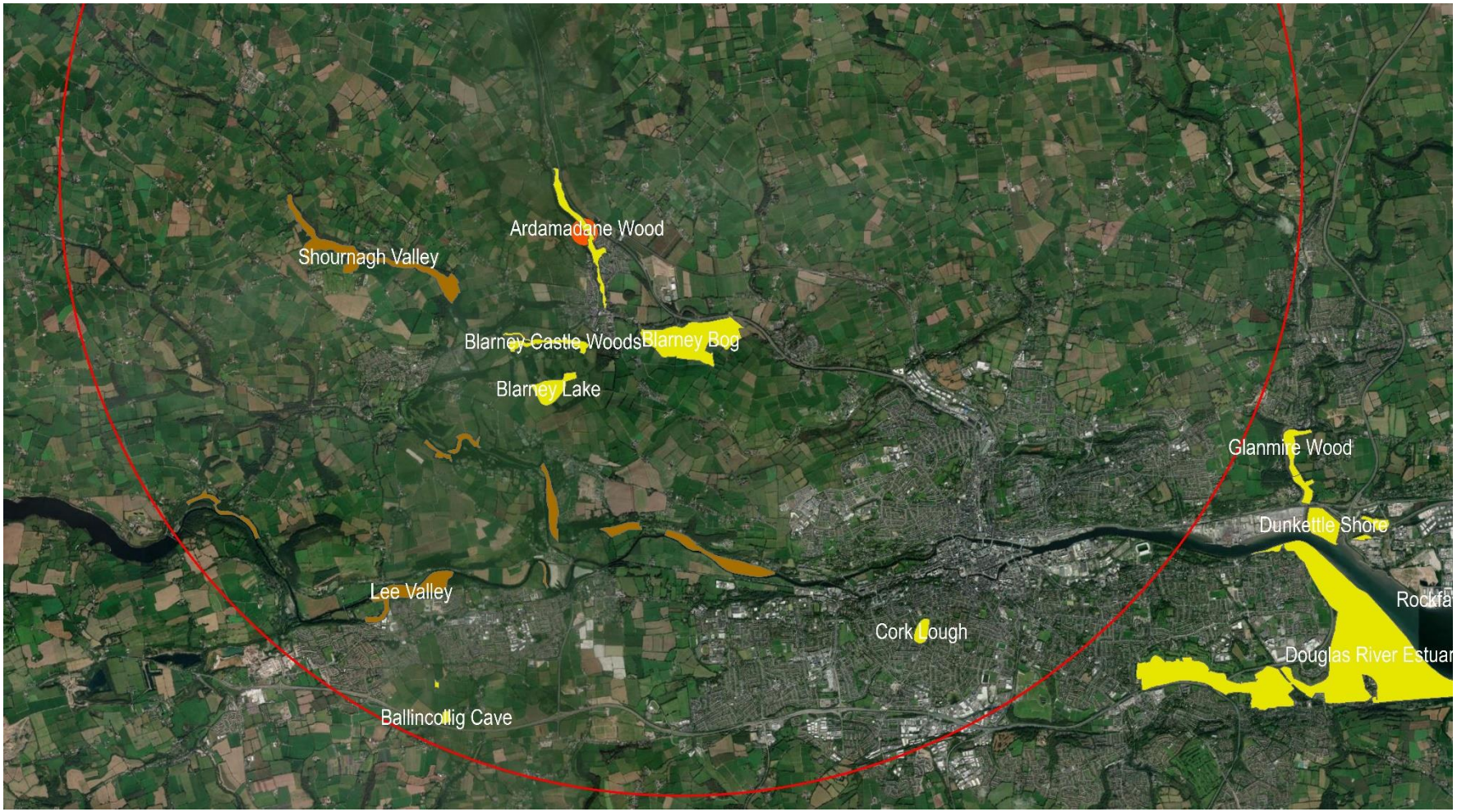

Figure 4. Proposed Natural Heritage Areas within 10km of the proposed site

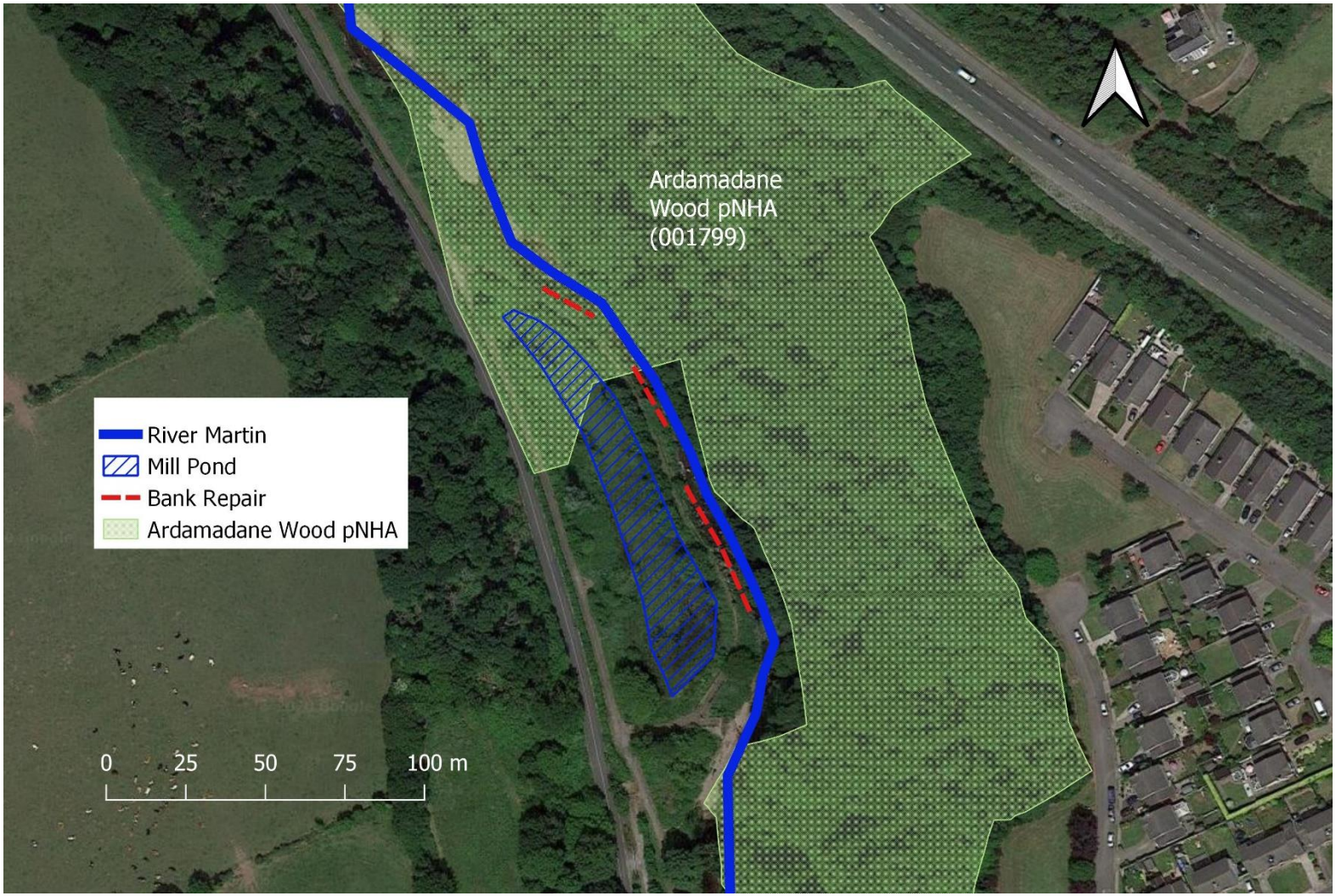

Figure 5. Location of proposed development area relative to Ardamadane Wood pNHA (001799)

4.2 Baseline ecology

4.2.1 Habitats

The habitats in the footprint of the proposed bank rehabilitation works at the Mill Pond are described below. The works footprint will be limited to the narrow strip of embankment between the north margin of the pond and the River Martin. The habitats recorded and plant diversity on the Mill Pond (south bank of the River Martin) were not particularly diverse given high levels of historical landscape modifications. This included historical bank works, artificial pond and pathway construction, in addition to landscaping, footpath construction etc. The most important habitats recorded were the River Martin itself (i.e. a semi-natural lowland depositing watercourse) and Ardamadane Woods pNHA which is situated on the north bank of the River Martin (opposite the works area). While there is some overlap with the pNHA designation (see Figure 5), the habitats on the south bank exhibit a much lower degree of naturalness than those in the core of the designation for the pNHA (i.e. oak woodland). All of the habitats recorded in the vicinity of the proposed works are described below and shown on Figure 6 below.

WL2 Treelines

The riparian treeline adjoining the River Martin consisted of a semi-mature treeline of alder (*Alnus glutinosa*), grey willow (*Salix cinerea* sp. *oleifolia*) and lime (*Tilia* sp.) but the treeline became more disjunct moving south. The treeline grew on thin soils over the existing river embankment and trees were typically no more than 6m in height with narrow trunk diameters at breast height (typically <0.3m). The riparian treeline had an understory of great willowherb (*Epilobium hirsutum*), bittersweet (*Solanum dulcamara*), hedge bindweed (*Calystegia sepium*), nettle (*Urtica dioica*), bramble (*Rubus fruticosus*) and ferns (*Dryopteris* sp.).

A second treeline occurred on the north bank of the Mill Pond margin opposite the riparian treeline on the River Martin. It was dominated by shrubby grey willow and alder that were overhanging the pond basin with scattered gorse (*Ulex europaeus*) and bramble in the understory. This treeline was more mature than the riparian treeline opposite on the south bank of the River Martin, having limited gaps.

A grassed over pathway existed between the wooden fence and treelines on the pond and river borders. It comprised common meadow species that included hogweed (*Heracleum sphondylium*), meadow buttercup (*Ranunculus acris*), common knapweed (*Centaurea nigra*), wild angelica (*Angelica sylvestris*), wood horsetail (*Equisetum sylvaticum*), Herb-Robert (*Geranium robertianum*), nettle, ivy (*Hedera helix*) and creeping bentgrass (*Agrostis stolonifera*).

Plate 1. Disjunct treeline along the riparian border of the River Martin

Hedgerow (WL1)

A hedgerow of hazel (*Corylus avelana*), oak (*Quercus* sp.) and ash (*Fraxinus excelsior*) bordered the tarmac walking path and Waterloo Road. The hedge had been topped and was densely planted.

Oak-Ash-Hazel Woodland (WN2)

The north bank of the River Martin opposite the works area was representative of an oak, ash and hazel woodland (WN2). The composition of the woodland opposite the Mill Pond area was of mature oak with frequent ash and occasional sycamore (*Acer pseudoplatanus*), lime and hazel near the River Martin. This area formed part of Ardamadane Wood pNHA.

Mixed Broadleaved Woodland (WD1)

A small area of mixed broadleaved woodland was present south of the pond basin separated by the footpath area. It comprised of osier (*Salix viminalis*), ash, grey willow and hazel with a bramble understory. It was situated on the sloping embankment adjoining the riverside pathway (Figure 6).

Plate 2. Mixed broadleaved woodland south of the Mill Pond

Flower Beds and Borders (BC4)

The area of land between the southern margin of the Mill Pond and pathway consisted of flower beds and borders (BC4). Species included catmint (*Nepeta* sp.), oxeye daisy (*Leucanthemum vulgare*), goldsturm (*Rudbeckia fulgida* sp.), blood red geraneum (*Geraneum sanguineum*) and panicle hydrangea (*Hydrangea paniculata*).

Plate 3. Flowerbeds and borders near the Mill Pond

The aquatic habitats i.e. River Martin (FW2) and the Mill Pond (FL8) are described below under aquatic ecology.

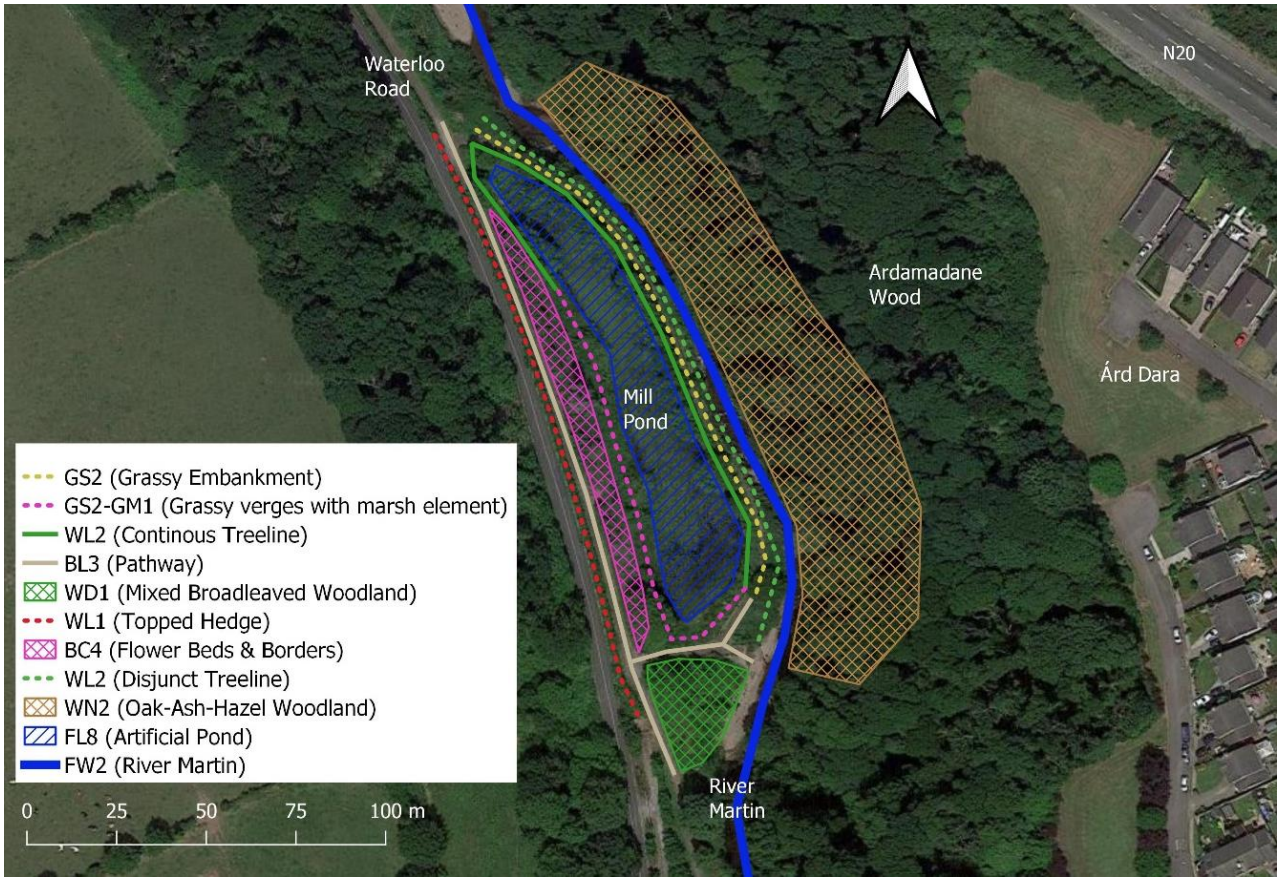

Figure 6. Habitat map of the study area according to Fossitt (2000)

4.2.2 Aquatic ecology

River Martin (Site 1 A)

The River Martin at site 1A was situated between the meander at the upstream extent of the works to 50m downstream. The river at this location could be considered a lowland depositing channel (FW2) but it exhibited the characteristics of a sandstone spate channel also (i.e. still having strong flows and being subject to frequent freshets). The bed was dominated by well-rounded cobble with coarse, medium and fine gravels. The channel was dominated by riffle and glide with more localised pool (i.e. in meander areas). The river had a well defined profile as exemplified by good channel sinuosity and the presence of river islands with exposed gravel. These exposed gravel areas supported localised watercress (*Nasturtium officinale*), fool's watercress (*Apium nodiflorum*), red shank (*Persicaria maculata*) and water pepper (*Persicaria hydropiper*). Aquatic macrophytes were limited to small patches of water-crowfoot (*Ranunculus penicillatus* var. *penicillatus)* <5% cover and emergent hemlock water dropwort (*Oenanthe crocata*) (very localised instream). Water-plantain (*Alisma plantago-aquatica*) was very localised in muddy patches of the river margins. More densely vegetated areas on gravels supported great willowherb, hemlock water dropwort, nettle and dock (*Rumex obtusifolius*). The riparian zone comprised mature crack willow (*Salix fragilis*), grey willow, alder (*Alnus glutinosa*) and more localised ash. The understory comprised dense bramble and nettle.

Site 1A on the River Martin had very good Atlantic salmon (*Salmo salar*) and brown trout (*Salmo trutta*) habitat. This included a combination of nursery, spawning and holding habitat. Nursery habitat was

frequent in shallow riffle and glide areas, with holding and spawning in deeper glide and pool tailings. European eel (*Anguilla anguilla*) was also likely to be present in deeper pool habitat. Some localised brook lamprey (*Lampetra planerii*) habitat was present in softer silt depositional areas of pools, but the area of soft silt and sand habitat was limited due to the higher energy of the system.

Plate 4. River Martin at Site 1A

River Martin (Site 1B)

The River Martin at site 1B was situated in the central point of the works area where the largest section of bank rehabilitation works is proposed. The channel at site 1B was a semi-natural sandstone spate channel that had much steeper banks than upstream with a very straight course. The banks had been straightened and heightened due to historical modifications, but the river showed good recovery. The bed was dominated by bedrock, boulder and coarse gravels (showing evidence of historical instream works but also higher energy due to straightening). Consequentially, this section was dominated by deeper glide and pool with more localised riffle. Aquatic macrophytes were absent apart from very localised hemlock water-dropwort (i.e. due to higher energy). Filamentous green algae (*Cladophora* sp.) covered 15% of the riverbed with *Lemanea* species covering 5% by area of the bed. The aquatic moss *Fontalais antipyrtica* was also present on boulders locally. The riparian zone was mixed with oak, willow, hazel and ash and frequent bramble. The Mill Pond side of channel (west bank) was much steeper and had less tree cover, exhibiting high erosion.

Site 1B supported some good nursery habitat for Atlantic salmon and trout. It also supported good holding habitat in deeper glide with more localised spawning. The presence of larger cobble and occasional boulder refugia offered good habitat for European eel.

Plate 5. River Martin at Site 1B

River Martin (Site 1C)

The River Martin at site 1C was a semi-natural sandstone spate channel as with sites 1A and 1B. The bed was dominated by small boulder, well rounded cobble and coarse gravel. Smaller sized medium and fine gravels existed in interstitial spaces between larger substrata. These were unbedded and suffered from light siltation only. The channel was dominated by riffle and glide with more localised pool (i.e. in meander areas). The river had well defined profile with good sinuosity that improved due to lower banks and no historical modifications to the bed or banks. Aquatic macrophytes were limited to small patches of emergent hemlock water dropwort (very localised instream). The aquatic moss *Fontanalis antipyretica* was present locally on boulders. Filamentous green algae covered 10% by area of channel (*Cladophora* sp.) with Lemanea algae also present very locally (1% cover). The riparian zone comprised mature oak, ash, grey willow and hazel with bramble, nettle and hemlock water-dropwort in the understory.

As with the other River Martin survey areas the channel had very good salmonid habitat. Site 1C supported mostly nursery habitat for Atlantic salmon and brown trout with no suitable lamprey habitat observed for ammocoetes. European eel was also likely to be present given the presence of cobble refugia. High numbers of elvers were recorded in the downstream connecting river (River Shournagh) during electro-fishing surveys in 2019 and it is likely that the River Martin is also an important nursery area (pers. obs.).

Plate 6. River Martin at Site 1C

Mill Pond (Site 2)

The Mill Pond was a small artificial pond water body (FL8), 0.53acres in size. It was between 1.0m and 1.4m deep. The pond basin was dominated by floating broad leaved pondweed (*Potamogeton natans*) that covered 80% of the basin. Other macrophytes recorded included occasional submerged bladderwort (*Utricularia* sp.). Ivy-leaved duckweed (*Lemna trisulca*) was recorded as occasional in clumps in the pond margins. Emergent bittersweet and water mint (*Mentha aquatica*) were present locally and also yellow flag (*Iris pseudacorus*). The pond margins supported variable species assemblages and included hemlock water-dropwort, great willowherb, nettle, creeping buttercup (*Ranunculus repens*), bittersweet, marsh woundwort (*Stachys palustris*) and water mint in wetter areas. Birds foot trefoil (*Lotus corniculatus*), clovers (*Trifolium* spp.), bush vetch (*Vicia sepium*) and some wildflower mixes were present near the flower beds and borders on the east bank of the pond. The north and western margins of the pond supported overhanging grey willow and alder with frequent bramble. It is unknown whether the Mill Pond supports any fish species as none were observed during the survey. The pond exhibited suitability for Rudd (*Scardinius erythropthalmus*) and Pike (*Essox lucius*) that are known from other lakes in the area e.g. Blarney Lake and Blarney Bog. Furthermore, due to the close proximity to the River Martin the pond likely also supports European eel (*Anguilla anguilla*) that use ponds as nursery habitats for feeding and refuge.

Plate 7. Mill Pond showing heavy growth of pond weed

Biological Water Quality

The macro-invertebrate samples collected from the River Martin were representative of High Status (Q4-5) water quality. Very few rivers in Ireland are achieving this water quality target nowadays and thus the river can be considered to have pristine water. This evaluation was attained at both sites 1A and 1B collected from areas at the upper and lower extent of the works areas. The Q4-5 evaluation was attained due to the high diversity of EPA group A (very clean water indicator species). A diversity of 5 number group A species of mayfly and stoneflies was recorded at sites 1 A and site 1B. The species composition recorded in the River Martin is summarised on Table 3 below.

Table 3a. Macroinvertebrate composition recorded at sites 1A & 1C in the River Martin

Group	Family	Binomial name	Site 1A u/s	Site 1C d/s	EPA Group
Stonefly	Chloroperlidae	*Siphonoperla torrentium*	3	4	A
Stonefly	Perlodidae	*Isoperla grammatica*	12	7	A
Stonefly	Nemouridae	*Amphinemura sulcicollis*	2	1	A
Mayfly	Heptageniidae	*Ecdyonurus venosus*	2	1	A
Mayfly	Heptageniidae	*Rhithrogena semicolorata*	11	8	A
Mayfly	Baetidae	*Baetis rhodani*		19	C
Mayfly	Ephemerellidae	*Seratella ignita*	3	22	C
Caseless Caddis	Hydropsychidae	*Hydrospyche siltalai*	7	4	C
Caseless Caddis	Ryacophilidae	*Ryacophila dorsalis*	4	1	C
Water Beetle	Hydraenidae	*Hydraena gracilis*	1	1	C
Water Beetle	Elmidae	*Limnius volckmari*		2	C
Freshwater Shrimp	Gammaridae	*Gammarus duebenii*	3	6	C
Black Fly	Simuliidae	*Simulium spp.*	6	13	C
River Limpet	Ancylidae	*Ancylus fluviatilis*		1	C
		Taxon Richness	**11**	**14**	

Number of EPA Group A Stoneflies & Mayflies	**4**	**4**	
Q rating	**4-5**	**4-5**	
WFD Status	**High**	**High**	

A three-minute sweep sample was collected from the Mill Pond. The widespread blue tailed damselfly (*Ischnura elegans*) was recorded present in the sample. Furthermore, Emperor dragonfly (*Anax imperator*) was recorded. This species has been spreading throughout the south and east of Ireland and is now a widespread species (least concern) in Britain and Ireland (Cham et al. 2014). The species composition did not have any rare aquatic invertebrate species and aquatic beetles were not found present.

Table 3b. Macroinvertebrate composition recorded in the Mill Pond

Group or Family	Common Name	Species	Number
Baetidae	Pond Olive	*Cloeon dipterum*	2
Limnephilidae	Cased Caddis	*Limnephilus marmoratus*	1
Cooenagrionidae	Blue tailed damselfly	*Ischnura elegans*	1
Aeshnidae	Emporer dragonfly	*Anax imperator*	2
Corixinae	Corixid	*larvae not speciated*	2
Asellidae	Water hoglouse	*Asellus aquaticus*	14
Hydrachnidia	Water Mite	Hydracarina (not speciated)	2
Chironomidae	Non-biting midge	*Chironomus spp.*	3
Lymnaeidae	Wandering snail	*Radix bathica*	5

4.2.3 Birds

The bird survey was undertaken in suitable weather conditions with good visibility, light wind, and a dry, warm and bright day on both survey visits. The first visit was somewhat disturbed by gardeners who arrived to work on landscaping the western boundary of the pond at 07.45am.

In total, 19 bird species were recorded during the survey (Table 4). This included 17 resident species and two summer migrants (Chiffchaff and Blackcap). The species list includes one species that is on the *Birds of Conservation Concern in Ireland* lists (Colhoun and Cummins 2013), the 'Amber-listed' Robin.

The most abundant species was the Blue Tit that occurred in abundance in the woodland (Ardamadane Woods) on both sides of the site. Breeding was confirmed for this species by the observation of fledged young and on the second visit family groups could be observed foraging in the trees. Other confirmed breeders were Mallard (on Mill Pond), Dipper (on the River Martin) and Great Tit, the latter in woodland habitat. Blackcap were the most audible species, singing loudly in woodland on both sides of the site.

Given the time of year, it was notable that no aerial hirundines (e.g. Swallow *Hirundo rustica*) were observed flying (feeding) over the pond.

Overall, the bird survey results point to a diverse mix of woodland species that are generally widespread and common species in Ireland (Table 4). Of note is the presence of Dipper on the river, and the confirmation of breeding within the stretch of river close to Mill Pond. Dippers are riparian (river edge) birds and are widespread in Ireland, generally on fast-flowing upper sections of rivers. The species is associated with breeding in man-made structures such as under bridges, but natural nest sites can be found in holes or crevices, within tree roots or rocks at the edge of rivers or ponds (e.g.

Shaw, 1978). We cannot rule out that this species does not breed within Mill Pond, although all observations were made of the species along the river.

Table 4. Bird species recorded within the survey area during the 2020 breeding season. The table provides the species' status (**R**esident, **S**ummer migrant) and an indication of conservation concern in Ireland (BoCCI, **R**ed or **A**mber-listed) after Colhoun & Cummins (2013). The current 18-year population trend is also given (after Lewis et al. 2019). * indicates species recorded in flight only.

Species	Latin name	Code	Status	BoCCI 2013	Peak number Visit 1	Peak number Visit 2	Habitat(s) observed within (Closest Distance)	Breeding Code	Breeding Status	Current ROI pop trend (after Lewis et al. 2019)
Mallard	*Anas platyrhynchos*	MA	R		2	13	Mill Pond	FL	Confirmed	-
Moorhen	*Gallinula chloropus*	MH	R		2		Mill Pond	H	Possible	-
Grey Heron	*Ardea cinerea*	H.	R			1	River Martin (0-50)	-	-	-
Woodpigeon	*Columba palumbus*	WP	R		2	1	Woodland (100+)	S	Possible	+37 (Increasing)
Jackdaw*	*Corvus monedula*	JD	R			1	Flight only	-	-	+37 (Increasing)
Hooded Crow	*Corvus cornix*	HC	R		1		Woodland (0-50)	H	Possible	+42 (Increasing)
Blue Tit	*Cyanistes caeruleus*	BT	R		8		Woodland (0-50)	FL	Confirmed	+13.0 (Increasing)
Great Tit	*Parus major*	GT	R		3	4	Woodland (0-50)	FL	Confirmed	+68 (Increasing)
Coal Tit	*Periparus ater*	CT	R		1	1	Woodland (50-100)	H	Possible	+30 (Increasing)
Long-tailed Tit	*Aegithalos caudatus*	LT	R		2		Scrub (pond edge) (0-50)	H	Possible	-2.1 (Stable)
Chiffchaff	*Pyhylloscopus collybita*	CC	S		1		Woodland (0-50)	S	Possible	+ 110.0 (Increasing)
Blackcap	*Sylvia atricapilla*	BC	S		3	3	Woodland (0-50), Scrub (pond edge) (0-50)	S	Possible	+1689.0 (Increasing)
Wren	*Troglodytes troglodytes*	WR	R		5	4	Woodland (0-50), Scrub (pond edge) (0-50)	S	Possible	+ 11.1 (Increasing)
Blackbird	*Turdus merula*	B.	R		2		Woodland (0-50), Scrub (pond edge) (0-50)	S	Possible	+18.3 (Increasing)
Dipper	*Cinclus cinclus*	DI	R		1	2	River Martin (0-50)	FL	Confirmed	-
Robin	*Erithacus rubecula*	R.	R	A	1		Woodland (0-50)	H	Possible	-15.0 (Declining)
Dunnock	*Prunella modularis*	D.	R		1		Woodland (0-50)	H	Possible	+26.0 (Increasing)
Chaffinch	*Fringilla coelebs*	CH	R		4	2	Woodland (50-100)	S	Possible	+ 40.0 (Increasing)
Bullfinch	*Pyrrhula pyrrhula*	BF	R		2	2	Scrub (pond edge) (0-50)	P	Possible	+ 85.4 (Increasing)

4.2.4 Non-Volant Mammals

No signs of otter were recorded within 150m upstream or downstream of the works. Particular focus was given to the detection of holts and couches (otter breeding and resting places). While otters most certainly use the River Martin, more open sections of channel near walkways tend to have lower relative marking densities (Macklin et al. 2019) and this may explain an absence of marking signs in the vicinity of the Mill Pond area. No badger setts were observed present in the adjoining Ardamadane woods along the river side of the woodland, but the species is known to be present in the woodland (pers. obs.) in areas of low disturbance.

4.2.4 Bats

There was no suitability for bat roosting along the riverside embankment and in the adjoining treelines of the River Martin in the works footprint. This was considered due to the absence of very mature trees with thick trunks and/or ivy cover. The absence of any old trees with suitable crevices indicated poor suitability for bats apart from evident high suitability for foraging along the river corridor. There was however, high suitability for bats to roost in some of the mature oak trees in Ardamadane Wood but this area does not overlap the works footprint and thus no roosts will be impacted directly.

4.2.7 Invasive alien species

Species listed as invasive in Ireland come from the *Invasive Species in Ireland prioritization risk assessment* last undertaken in 2013 (http://www.biodiversityireland.ie/projects/invasive-species/species-lists/). From this, 48 non-native species were ranked as at risk of having a High Impact and 78 species at risk of having a Medium Impact.

No 'high impact' invasive alien species (IAS) were recorded within the proposed development site.

4.2.8 Ecological Evaluation

The assigned ecological value of on-site ecological features is given in Table 5 below.

Table 5. Assigned ecological value of on-site ecological features

Habitat/Area	Ecological Value	Rationale/notes
Ardamadane Wood pNHA (001799)	National Importance	Ardamadane Wood pNHA (001799) is a natural heritage area designated for semi-natural oak dominated broadleaved woodland and can be considered of National Importance. It also helps preserve the salmonid habitat and clean waters of the adjoining River Martin that fall within the pNHA boundary for the woodland.
River Martin (FW2)	National Importance	The River Martin overlaps with the pNHA boundary of Ardamadane Wood (001799). The River Martin contains a healthy salmonid population and pristine (high status Q4-5 water quality, which is a rare water quality status category in Ireland).
Mill Pond (FL8)	Local Importance (Higher Value)	The Mill Pond was a heavily modified pond habitat suffering from enrichment. The pond supported dragonfly and damselfly populations and a low diversity of macrophytes. However, as pond habitats are scarce in County Cork, the pond can be considered important for

		local biodiversity and also a potential nursery area for European Eel. It can thus be considered of Local Importance (Higher Value).

Birds

The bird species recorded within the study site are considered widespread and common. Under the Wildlife Act, 1976 (as amended 2000), all wild birds and their nests and eggs, other than wild birds of the species mentioned in the Third Schedule to this Act, are protected under Irish Law. Consequently, birds are an '*important ecological feature'* and will be considered in the impact assessment stage of this EcIA.

Mammals

Otters are protected under Annex II and IV of the EU habitats Directive, and under the Wildlife Act, 1976 (as amended). As such there is strict regulation on development in close proximity to known areas of Otter activity. Consequently, Otters are an '*important ecological feature'* and will be considered in the impact assessment stage of this EcIA.

The proposed works footprint is considered to be of low value for roosting bats, due to the absence of suitable trees for roosting. The proposed site is considered to be of moderate to high value for foraging and commuting bats. All Irish bat species are protected under the Wildlife Act (1976) and Wildlife Amendment Act (2000). All Irish bats are listed in Annex IV of the Habitats Directive and the Lesser horseshoe bat is further listed under Annex II. Bats are further protected under the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982), which, in relation to bats, exists to conserve all species and their habitats, and the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983). The Irish government has ratified both these aforementioned conventions. Consequently, bats are an '*important ecological feature'* and will be considered in the impact assessment stage of this EcIA.

5.0 Impact assessment

5.1 Assessment of impacts upon site and local ecology

As per the CIEEM guidelines (CIEEM, 2016), likely significant impacts are assessed only for *Key Ecological Features* (Section 2.1). Potential impacts are therefore considered for habitats/ecological features considered of High Local value or above only, namely treelines (part of Ardamadane Wood pNHA), River Martin, Mill Pond, Otter, riparian birds and bats.

Potential impacts upon treelines

The eastern boundary riparian treeline bordering the River Martin and the adjoining Mill Pond will have to be removed in part where scattered trees (treeline not continuous) overlap the proposed embankment works area (i.e. root protection zones). The trees present on the river embankment are less than 6m in height with stem diameters <0.3m. These trees do however provide important ecosystem functioning in terms of shading and allochthonous food supply. It is estimated that 15-20 small trees will be removed. The loss of these trees would have negative effects on riparian birds, fish and invertebrates. Therefore, in the absence of mitigation the removal of these trees during construction will be a **significant negative impact** at the local level**.**

Potential impacts upon the River Martin

Construction Phase

There will be direct impacts upon the River Martin during the construction of the proposed sandstone rock bank reinforcement works (i.e. installation of large sandstone flagstone) due to instream works. Works will require heavy machinery in the river bed (i.e. an excavator) which could damage the river bed. The works will also require the excavation of the riparian embankments which will liberate suspended solids and damage the adjoinining salmonid spawning gravels by blocking interstitial spaces and increasing the risk of mortality to salmonid eggs and displace fish populations locally. While lamprey species are less sensitive to siltation than salmonids, lamprey eggs in redds during the spring could also become smothered and damaged by siltation. Siltation could also impact riverine invertebrate populations and potentially reduce the high-status water quality of the River Martin. This indirectly could further impact fish, Dipper and bat species that feed upon riverine invertebrates.

The proposed works will not impact the Annex I Habitat, '3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation' as no good representation of this habitat was recorded in the footprint of the works area.

Construction chemicals including hydrocarbons could pollute the River Martin due to spillage or entrainment in surface water during construction. This could result in significant impacts upon the water dependant species and habitats of the River Martin including the High Status water quality at the local scale (i.e. within 1km of the development site). This could also impact riparian bird species such as Kingfisher (*Alcedo atthis*) and Dipper and also Otter that all rely on the food resources of the River Martin. In summary the direct and indirect effects from construction phase activities in the absence of mitigation are considered **significant negative** at the local scale.

Operation Phase

The operational phase of the development is likely to have an **imperceptible** or **slight positive effect** because no further erosion of the embankments will occur that would exacerbate pollution impacts. The project design, which uses sandstone flag rather than boulders, will not result in increased hydro-morphological impacts to the channel, given historical modifications have already occurred. The proposals will not increase the pre-erosion embankment footprint and thus will not result in significant changes in flow rates and resultant hydromorphological deterioration.

As such the proposed embankment works are unlikely to result in a deterioration of the existing Q4-5 High Status water quality of the river, or cause a deterioration of habitats used by salmonid fish, Lamprey, Otter, Kingfisher and instream invertebrates.

Potential impacts upon Otter

No otter breeding and or resting places or sign marking was recorded within 150m of the proposed works areas. Nonetheless otter do use the channel for feeding and commuting and disturbance during construction may result in **temporary slight negative impacts** to otter at the local scale.

Potential impacts upon birds

The bird species recorded within the site were common and widespread species in the Irish countryside. However, the loss of existing habitats within the proposed site namely riparian trees, underlying scrub and grassy strips of meadow will give rise to a loss of nesting and foraging habitat for birds, considered to be a **moderate negative impact** at local level.

Potential impacts upon bats

Loss of Roosting Opportunities

The site clearance works required to facilitate the proposed development will result in the removal of sections of a disjunct treeline along the River Martin. As outlined above, no bat roosting potential was identified in these trees given narrow stem diameters <0.3m, lower height 6m maximum and absence of ivy cover. The most suitable roost areas were identified in trees within Aradamadane Wood, situated on the east bank of the river. Bank side clearance will therefore result in the loss of a small number of sub-optimal bat roosting opportunities. The loss of sub-optimal roosting habitat for bats along the west bank of the River Martin, would therefore represent a **non-significant impact** upon bats at the local scale in the short term. However, if the trees are not replanted then this could represent a moderate negative impact in the longer term (at local scale) because the existing trees will mature over time and act as potential roost areas in the future.

Loss of Commuting and Foraging Habitat

Many bat species utilise landscape features, such as hedgerows, to commute around the landscape and treelines are known foraging routes on rivers. These features offer bats a degree of protection from aerial predators and can act as navigational aids. If linear landscape features are removed or severed, it may reduce the ability of bats to commute in the landscape which can reduce the available foraging habitat of bats or isolate bats from alternative roosts. Artificial lighting can also result in the severance of bat commuting routes.

The existing site appears to provide connectivity between two areas of woodland, north and south. Disruption to commuting routes can occur as a result of the loss of a feature, such as a hedgerow, and

through artificial lighting of the feature. Disruption of commuting routes can hinder a bats ability to access foraging habitat etc. The disruption to existing commuting routes along the River Martin used by bats represents a **moderate negative impact** on bats, a local scale, in the short term. Potential impacts to commuting are however reversible in the medium term once trees are replanted.

5.2 Cumulative impacts

Projects

A search of Cork City Council's online planning enquiry database was undertaken to identify other planning applications dated within four years of the 1st August 2020, that are proximal or within the proposed works area (searched under the location 'Blarney'). This search yielded some 200 planning applications which were reviewed individually. The majority of the planning applications relate to the construction of single or small-scale private domestic dwellings, notable exceptions being the following:

166743 (November 2016, conditional) - Permission for the construction of a three-storey post-primary school building, Shean Lower, Blarney Co. Cork.
166489 (November 2016, conditional) - Demolition of existing toilet block, kiosk and terrace seating area and construction of replacement single storey building comprising public restrooms, servery with ancillary food preparation area, food and bin storage rooms, staffroom, covered outdoor visitor seating area and all ancillary site development works, Blarney Castle Estate.
176917 (January 2018, conditional) - Light industrial/warehouse building with ancillary office space (suitable for subdivision into 2 units), car parking and associated site works, Blarney Business Park, Shean Upper.
185086 (June 2018, conditional) - construction of an ESB MV sub-station, Blarney Castle Estate.
186632 (February 2019 conditional) – development of a light industrial/warehouse building, Blarney Business Park, Shean Upper.
187111 (August 2019 conditional) - Construction of a nursing home, 29 no. detached houses and all ancillary site works on the site of the former St. Ann's Hydropathic Establishment, Tower, Blarney, Co. Cork.
1939001 (September 2020) - Permission for the following Phase 2 development at Gleann Fia, Bawnafinny (townland), Tower, Blarney, Cork comprising (1) The removal of existing temporary construction compound; (2) The change in levels to estate roads and 22 no. dwelling houses permitted under Cork County Council Ref. No. 18/5562 (Phase 1) and (3) The construction of 40 no. dwelling houses permitted under Phase 2 (all units will have an option of side ground floor windows and 31 no. units will have an option of a rear sunroom, and (4) All associated ancillary development works including access, footpaths, parking drainage, landscaping and amenity area.

2039513 (September 2020) - Permission for the construction of a mixed use development (totalling 16,780.51 sq m Gross Floor Space) at this site of the former Blarney Park Hotel and Leisure Centre complex of approximately 3.6 hectares located at St. Ann's Road, Monacnapa, Blarney, Cork.

2039502 - Permission for construction of a 3-storey primary care centre with 5 no. ground floor retail units and café at St. Ann's Road, Monacnappa, Blarney, Cork.

Plans

Masterplan for Stoneview, Blarney, Co. Cork - this masterplan is for a new residential neighbourhood proposed at Stoneview, Blarney which was prepared in response to objective HOU 6-3 of the Blarney - Kilbarry Special Local Area Plan that was adopted by Cork County Council on 6th September 2005.

This mixed-use development could provide up to 2,500 new dwellings in the area near a proposed railway station, through a phased programme of development. The masterplan states that the existing wastewater treatment plant serving Blarney/Tower will need to be upgraded to cater for the additional connection (BSM, 2006).

Blarney Macroom Municipal District Local Area Plan – highlights the need for the development of housing to cater for future population needs. The proposed development site under current consideration is classified as a 'proposed regeneration area'.

Cork County Development Plan 2014 – states that the current position with regards wastewater treatment is that 'current infrastructure sufficient to achieve population growth target by 2022' but significant infrastructure will be required in the medium/long-term.

Following review, there appears to be no other project or plan that will act in combination to result in significant impacts upon the local ecology of the River Martin. However, wastewater treatment is clearly an issue for future developments and to safeguard the water quality status of the River Martin (the receiving waters) there may need to be an upgrade to wastewater treatment infrastructure in the future.

5.3 Do-nothing impact

If the proposed bankside rehabilitation works are not undertaken at the Mill Pond, then the site will continue to exist as described in the 'baseline ecology' section of this report. However, over time the existing riverbank (east bank on Mill Pond side) will continue to erode which would decrease bank stability, resulting in the release of high levels of sediment to the adjoining River Martin. It would also result in the loss of the existing riparian treeline as the river continues to cut into the west bank.

5.4 Mitigation measures

Mitigation for treelines

It is estimated that 15-20 small trees on the east bank of the River Martin will be removed when taking into consideration an RPA buffer (i.e. Root Protection Area) in the footprint of the bank rehabilitation areas. It is recommended that an arborist or other suitably qualified professional prepares a plan for tree protection and tree removal in conjunction with the contractor's method statement for bankside work rehabilitation. All trees lost will be replanted following construction to restore the riparian areas affected by the works.

Mitigation for the River Martin

This section of the report summarises the design considerations to prevent impacts to the River Martin including water dependant species that rely on the riverine habitat. There is potential to damage the river directly through the use of machinery within the river, and indirectly through the release of sediment and or construction pollutants (i.e. hydrocarbons, lubricants and cement).

A detailed temporary works method statement should be completed by the contractor in agreement with Inland Fisheries Ireland (IFI) and the National Parks & Wildlife Service (NPWS) in advance of construction commencement. This method statement should adopt the measures below. In addition to the instream works element, the method statement should detail which trees will be removed and which will be retained. All information should be clearly mapped and transferred to an Ecological Clerk

of Works (EcOW) who will oversee the works and ensure the implementation of mitigation. No instream works should occur during the salmonid close season (i.e. October through June). It is proposed that the instream works be undertaken during August and September 2021.Plant can mobilise to site the last week in July but no instream works should be undertaken until the breeding bird survey results have confirmed no active riparian nests in the works footprint. Bankside works such as the reinstatement of the fence line and path are permitted to occur in October once following the completion of instream works.

As there is no option but to work from within the River Martin given very steep banks, a wheeled excavator should be used over a track machine where feasible. The use of a wheeled machine over a track excavator will minimise damage to river gravels that would be compacted and crushed by a track machine. This would kill invertebrates and small fish. The machine should be clean of fuel, oil and lubricants (i.e. steam washed) before use on site. Refuelling should not occur within the watercourse and it is recommended that machines are only refuelled in the old Car Park south west of the Mill Pond to minimise risk of water pollution by spillages.

The works area on the west bank of the River Martin should be fully bunded with 1 tonne bags filled with gravel (rather than sand) and wrapped with 1200 gauge plastic to help form a watertight seal. Small sand bags should be used inside the bund to reduce any further water incursion. Finally, a four-inch pump should be used to over pump water from the bund into a silt buster unit or other device. This should then discharge through a silt bag placed in an area of exposed dry gravel to the south of the Mill Pond.

As a concrete pour is required for footing of the rock armouring (i.e. sandstone flag), a 1200-gauge plastic membrane should be positioned on the embankment bed adjoining the river to prevent mixing of concrete with river water. This method is very successful and has worked on other large instream projects e.g. River Suir at Ardfinnan (pers. obs.). Once the flagstone embankment footing is in place and the rock wall built, concrete can be added in phases behind the wall, with the fluidity of the 35N mix controlled by an experienced operator. This will ensure no mixing of concrete with river water. As with suspended solids, the EcOW should monitor concrete pouring and all bankside works. The EcOW should also maintain a site log to ensure pollution control compliance that will be made available to IFI. The EcOW should be hired independently of the contractor.

Excavated soil should be moved by a dumper to a designated soil storage area in the old car park south west of the Mill Pond. This area has been used in the past for storage of landscape mulch and other material given it is separated from the River Martin. The soil excavated should be reinstated and landscaped into the completed embankments. A roll of hessian should be placed over the reinstated soil and pinned with stakes to prevent rain wash out of soil post completion of works. Vegetation will grow naturally through the hessian layer, which will degrade overtime. Alternatively. the exposed soil could be seeded with wildflowers and a grass mix to help bind the soil.

The measures above will reduce siltation risks to the water dependant species of the River Martin. The use of a very experienced and suitably qualified contractor specialising in riverside works will reduce the likelihood of any significant pollution risks. Furthermore, an Ecological Clerk of Works (EcOW) will be present on a regular basis during the construction phase and will monitor water visually inclusive of turbidity upstream and downstream of the works area. The EcOW will attend weekly progress meetings to discuss ecological compliance during the construction phase. They will advise on measures to minimise ecological and water quality impacts through recommendations made.

The operational phase of the development will not result in any detrimental impacts to water quality (i.e. negligible impacts) once the banks regenerate with the proposed planting of exposed soils and the reinstatement of native trees.

Mitigation for Otter

As there were no otter signs detected during the site surveys, there is no requirement for a derogation to disturb the breeding and or resting places of otter. Otter use the River Martin for commuting, feeding and there are also known holt areas downstream near Blarney (pers. obs.). As such there is a possibility of a new holt being detected prior to construction. Therefore, a pre-construction otter survey is recommended in advance of construction commencement to ensure that no otter breeding or resting places overlap the works area. Should a holt be detected a derogation license application should be sought to disturb otter with an associated schedule of mitigation implemented as appropriate.

Mitigation for birds

The direct loss of nests and death of chicks can be avoided if the works are undertaken outside of the bird breeding season. Under the provisions of the Wildlife (Amendment) Act 2000, to avoid impacts upon breeding birds, no vegetation clearance should be undertaken during the bird breeding season (1st March – 31st August) (Wildlife (Amendment) Act 2000. However, these timings mean that the works period will be constrained. Therefore, we recommend that works could proceed inside the month of August but with caution. While most species have fledged young by August, some bird species breed later in the year. Subject to the results of a pre-construction breeding bird survey/nest search of the works area mobilisation of plant to site for site preparatory works could take place in late July with instream works carried out no earlier than the 1st August 2021. Once breeding is ruled out, construction may be able to commence.

Mitigation for bats

Protection of Roosting Bats During Site Clearance

No bat roost potential was identified during the site walkover in the footprint of the proposed works (i.e. an absence of trees with suitability for bat roosting on the west bank of the River martin). Suitable roosts existed on the east bank of the River Martin in Ardamadane Wood pNHA but this area will not be entered or interfered with during construction. The ecological clerk of works (EcOW) will monitor construction and ensure that the works will only occur in the agreed works footprint in conjunction with a method statement agreed by IFI and the NPWS in advance of works. This will ensure no impacts to bats and or to habitats other than those within the direct works footprint.

Maintaining Landscape Connectivity

In order to minimise impacts on commuting bats, the planting of riparian trees is proposed to replace those lost along the west bank of the River Martin (i.e. no net loss of biodiversity). Trees including ash, oak, alder and grey willow should be considered and the number of trees planted should be equal or greater to those lost.

Permanent Artificial Roost

While it is unlikely that any bat roosts will be affected as a result of the proposed works, consideration should be given to providing a permanent bat roosting opportunity as part of this project. This could be achieved through the provision of a bespoke structure, or by installing a commercially available, purpose made artificial roost on trees along the river walkway.

A wide range of products are available which provide artificial bat roosting opportunities for crevice dwelling species such as Leisler's Bat and Pipistrelles and Schwegler's 'Bat Winter Roost 1WQ' is an example of a suitable product. Ecological advice should be sought in relation to the design/selection and the locating of an artificial bat roost.

Temporary Artificial Roosts

Bat boxes are commonly employed to mitigate the loss of tree roosts. These are often hung on existing trees. More robust types, such as woodcrete boxes, can be expected to last for approx. 15 years in Ireland. Opportunities to deploy a small number of bat boxes should be explored, and ecological advice sought as to their location. Bat boxes should only be erected in locations where they are safe from vandalism. If used, they should be erected min. 5m above ground level and in locations where climbing-unaided is difficult.

Reduction of Lighting Impacts

Construction works should take place during daylight hours only, and the site should not be lit during the hours of darkness. In relation to the operational phase, there are no proposed lighting plans on the short section of the river walk loop bordering the Mill Pond and River Martin which is welcomed. Lighting in this area would be too close to the river and could create a light barrier to commuting bats.

Table 6. Impact assessment summary table – the potential impacts upon key ecological features with impact significance prior to and post (residual) the use of recommended mitigation measures.

Ecological features	Potential impacts	Impact significance	Proposed mitigation measures	Residual impact
Treelines	Treelines will be removed	**Significant negative at local level**	The treeline removed from the east bank of the River Martin will be replanted with native species (i.e. alder, ash & willow). The contractor will prepare a construction method statement that includes methods to minimise interference and impacts upon trees to be retained, including the marking of trees to be removed and the use of tree protection zones to protect those to be retained.	**Imperceptible**
River Martin	Surface water from the **construction phase** (i.e. site clearance and ground works phase) could increase siltation levels in the River Martin downstream. This may could impact salmonid and lamprey spawning gravels by blocking interstitial spaces and increasing the risk of mortality. While lamprey species are less sensitive to siltation than salmonids, lamprey eggs in redds during the spring could also become smothered and damaged by siltation. Tracking instream by machinery would damage instream gravels, kill juvenile fish and invertebrates. Construction chemicals including hydrocarbons and concrete could enter the River Martin during construction due to spillage. No operational phase impacts are considered likely as the river banks would be restored.	Significant negative impact at the local scale.	Full implementation of an agreed temporary woks method statement with IFI and the NPWS with measures to minimise impacts upon surface water including surface water quality and water dependant species and habitats. This would include a siltation and surface water management plan, using a wheeled excavator instream rather than a track machine where possible, refuelling away from watercourses, Ecological Clerk of Works onsite and the utilisation of an experienced contractor. Other considerations would be a plan for cement pouring, storage of soil away from the watercourse and the reinstatement of the riverbanks on completion of works (i.e. installation of hessian layer and reseeding/ replanting of exposed soil layer). Trees would also be replanted.	**Slight negative short term at local scale**

Otter (*Lutra lutra*)	No breeding or resting places of otter were detected. However, the proposals may indirectly impact otter should prey fish be impacted and or through disturbance.	**Moderate negative at local scale**	The works will only be undertaken to minimise water quality impacts. They will be undertaken during daylight hours and a pre-construction holt survey will be undertaken in advance of works.	**Imperceptible impact.**
Birds	The loss of existing habitats within the proposed site namely riparian trees and scrub in understories.	**Moderate negative effect at local scale.**	The direct loss of nests and death of chicks can be avoided if the works are undertaken outside of the bird breeding season (1st March – 31st August) (Wildlife (Amendment) Act 2000. However, to facilitate works August and September would be required. A pre-construction breeding bird survey would be undertaken in late July to establish the presence of chicks in the works footprint. Works can commence following fledging of chicks.	**Imperceptible impact.**
Bat species	No roosting areas will be removed as the trees in the footprint of the works area are unsuitable as roosts. However, the foraging corridor of bats may be disturbed at the local scale.	**Slight negative impact**	Two structures are present on the eastern boundary of the site and these are proposed for removal. Prior to their demolition, these structures should be inspected by an Ecologist to ensure no bats are present. In the event bat(s) are present the structures may only be removed with a roost derogation license issued by NPWS. A number of trees are proposed for removal which were considered to have a very low likelihood to support roosting bats. As a precaution these trees should be lowered carefully to ground level using appropriate machinery and allowed to remain at ground level untouched for 24 hours to allow any bats which may be present to safely depart. *Maintaining Landscape Connectivity* - In order to minimise impacts on commuting bats, replanting of riparian trees on the west bank of the River Martin will be carried out once the bank rehabilitation works have been completed. Replanting of trees should be undertaken in accordance with an arborists plan. *Permanent Artificial Roost* - consideration should be given to providing a permanent bat roosting opportunity as part of this project. This could be achieved through the provision of a bespoke structure, or by installing a commercially available,	**Imperceptible impact.**

			purpose made artificial roost on the external facade of a nearby building. Ecological advice should be sought in relation to the design/selection and the locating of an artificial bat roost. *Temporary Artificial Roosts* - opportunities to deploy a small number of bat boxes should be explored, and ecological advice sought as to their location. *Reduction of Lighting Impacts* - construction works should take place during daylight hours only, and the site should not be lit during the hours of darkness. If some lighting is required for health, safety or security reasons, lighting units should not be installed within 10m of existing treelines or hedgerow habitats and lighting should be directed away from such sensitive ecological features. There will be now operational phase lighting required for the pathway once the banks are reinstated.	

5.5 Impact assessment conclusions

The bankside rehabilitation works will ensure no further erosion of eastern riverbank and thus prevent medium and longer-term damage to the river from sedimentation and erosion if the pathway was left in its current state. The nature of the bank reinforcement works that will utilise sandstone flag, positioned vertically rather than at an angle (as would be traditionally applied in boulder rock armour) will minimise any footprint within the River Martin. This approach will prevent any significant negative hydrological impacts to the channel when viewed in respect of the pre-construction state. It is important to note that the area of the proposed works was also altered historically with deepening of the channel and heightening of the river banks on the eastern side. Furthermore, all trees removed from the east bank will be replanted and there will be no incursion into the adjoining Mill pond or Ardamadane Wood pNHA on the east bank of the River Martin. The temporary works design will be subject to a method statement agreed with the NPWS and IFI. All works will be supervised by an Ecological Clerk of Works and the preservation of both water quality and of the ecological sensitivities of the site will be the key priorities.

Given adherence to the measures as described in the mitigation section for the temporary works during construction and with the incorporation of mitigation measures, the proposed project is considered unlikely to result in any significant negative impacts upon within-site/local or wider ecology. As the operational phase utilises a sandstone flag embankment and involves the reinstatement of a footpath and trees, with no proposals for lighting the riparian pathway, the proposals will not result in any deterioration of the riparian corridor's ecological functioning. As such the operation of the pathway as an amenity for local people adjoining the Mill Pond and River Martin will not result in any significant negative impacts to the ecology of the site.

6.0 AA Screening

Table 10. Habitats Directive Screening Assessment

Project Details	
Name of project	Bank rehabilitation works at Mill Pond, Waterloo, Blarney, Co. Cork.
Natura 2000 sites within potential impact zone	• Great Island Channel Special Area of Conservation (SAC Site Code 1058) • Cork Harbour SPA (Site Code 4030)
Qualifying features of Natura 2000 sites	The Great Island Channel SAC stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. It is an integral part of Cork Harbour which contains several other sites of conservation interest. Within the site is the estuary of the Owennacurra and Dungourney Rivers and these rivers, which flow through Midleton, provide the main source of freshwater to the North Channel. The site has been selected as a Special Area of Conservation (SAC) selected for the following habitats that are listed on Annex I of the E.U. Habitats Directive: • Tidal Mudflats and Sandflats (1140) • Atlantic Salt Meadows (1330). Cork Harbour SPA (4030) is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl, for which it is amongst the top ten sites in the country. At the time of site designation, the site supported internationally important numbers of Black-tailed Godwit *Limosa limosa islandica*, and Redshank *Tringa totanus*, while a further 20 non-breeding (wintering) waterbird species occurred in numbers of national importance. **Special Conservation Interests:** Wintering species: Shelduck (*Tadorna tadorna*), Wigeon (*Anas penelope*), Teal (*Anas crecca*), Pintail (*Anas acuta*), Shoveler (*Anas clypeata*), Red-breasted Merganser (*Mergus serrator*), Little Grebe (*Tachybaptus ruficollis*), Great Crested Grebe (*Podiceps cristatus*) , Cormorant (*Phalacrocorax carbo*), Grey Heron (*Ardea cinerea*), Oystercatcher (*Haematopus ostralegus*), Golden Plover (*Pluvialis* apricaria), Grey Plover (*Pluvialis squatarola*), Lapwing (*Vanellus vanellus*), Dunlin (*Calidris alpina*), Black-tailed Godwit (*Limosa limosa*), Bar-tailed Godwit (*Limosa lapponica*), Curlew (*Numenius arquata*), Redshank (*Tringa totanus*), Black-headed Gull (*Chroicocephalus ridibundus*), Common Gull *(Larus canus*), Lesser Black-backed Gull (*Larus fuscus*). Breeding species: Common Tern (*Sterna hirundo).*
Distance of project from Natura 2000 sites	> 10km.
Is the project directly connected with or necessary to the management of the sites?	No.
Are there other projects that together with the project being assessed could affect the sites?	Please refer to Section 5.2.
Brief description of project	Bank stabilisation works and riverside path repairs are required at Mill Pond, Waterloo Road, Blarney, Co. Cork over circa. 100m of riverbank. Currently sections of the banks have been eroded from the river with collapse of historical boulder bank reinforcements and earth into the River Martin. This has encouraged further scouring out of the banks and further erosion of a pathway between the Mill Pond and the river. The Waterloo community group wish to rehabilitate the banks to reinstate them in order

	to restore the river walkway. The works will also include the reinstatement of the path and wooden fence line that exists between the Pond and the River Martin.
Is there a surface water connection between the project sites and Natura 2000 sites?	Yes, but distant >10km.
Environmental management procedures as standard practice during the proposed works?	Yes, plus mitigation measures to protect local ecology.

Describe the individual elements of the project (either alone or in combination with other projects) likely to give rise to impacts on the Natura 2000 site):
Impacts are unlikely to occur on downstream Natura 2000 sites. Mitigation measures have been provided to minimise the impacts of the proposed project on local ecology. These will ensure no downstream impacts upon Natura 2000 sites. However, even in the absence of mitigation measures, downstream impacts would be unlikely due to the distance to Natura 2000 sites (>10km) and the fact that the features of the Natura 2000 sites are marine or linked to marine systems and are not freshwater. *Impact prediction - Imperceptible Impact* (high level of confidence).
Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on Natura 2000 sites by virtue of: *(a) Size and scale; (b) Land-take; (c) Distance from Natura 2000 Site or key features of the Site; (d) Resource requirements; (e) Emissions; (f) Excavation requirements; (g) Transportation requirements; (h) Duration of construction, operation etc.; and (i) Other.*
As above. *Impact prediction - Imperceptible Impact* (high level of confidence).
Describe any likely changes to the site as a result of: (a) Reduction of habitat area, (b) disturbance to key species, habitat or species fragmentation, (c) reduction in species density, (d) changes in key indicators of conservation value or climate change.
As above. *Impact prediction - Imperceptible Impact* (high level of confidence).
Describe any likely impacts on the Natura 2000 site as a whole in terms of: (a) Interference with the key relationships that define the structure of the site, and (b) Interference with key relationship that define the function of the site.
As above. *Impact prediction - Imperceptible Impact* (high level of confidence).
Conclusion
No impacts are predicted to occur upon downstream Natura 2000 sites as a result of the proposed project.

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Appendix 1

Breeding evidence codes
(https://www.bto.org/our-science/projects/birdatlas/methods/breeding-evidence)

Possible breeder	
H	Species observed in breeding season in suitable nesting **H**abitat
S	**S**inging male present (or breeding calls heard) in breeding season in suitable breeding habitat
Probable breeding	
P	**P**air observed in suitable nesting habitat in breeding season
T	Permanent **T**erritory presumed through registration of territorial behaviour (song etc) on at least two different days a week or more apart at the same place or many individuals on one day
D	Courtship and **D**isplay (judged to be in or near potential breeding habitat; be cautious with wildfowl)
N	Visiting probable **N**est site
A	**A**gitated behaviour or anxiety calls from adults, suggesting probable presence of nest or young nearby
I	Brood patch on adult examined in the hand, suggesting **I**ncubation
B	Nest **B**uilding or excavating nest-hole
Confirmed breeding	
DD	**D**istraction-**D**isplay or injury feigning
UN	**U**sed **N**est or eggshells found (occupied or laid within period of survey)
FL	Recently **FL**edged young (nidicolous species) or downy young (nidifugous species). Careful consideration should be given to the likely provenance of any fledged juvenile capable of significant geographical movement. Evidence of dependency on adults (e.g. feeding) is helpful. Be cautious, even if the record comes from suitable habitat.
ON	Adults entering or leaving nest-site in circumstances indicating **O**ccupied **N**est (including high nests or nest holes, the contents of which cannot be seen) or adults seen incubating
FF	Adult carrying **F**aecal sac or **F**ood for young
NE	**N**est containing **E**ggs
NY	**N**est with **Y**oung seen or heard

Appendix 2

Certificate of Competence

Ross Macklin BSc HDip GIS Dip IPM PhD (in prep) MCIEEM MIFM (Triturus Environmental Ltd.) is an aquatic ecologist with 15 years professional experience. Ross has considerable experience in Environmental impact Assessment and Ecological Impact Assessment. He regularly conducts protected aquatic species surveys for fish, invertebrates and macrophyte plants and is one of the most experienced aquatic ecologists in Ireland.

Dr. Lesley Lewis BSc PhD MCIEEM (Limosa Environmental) has over 20 years professional experience as an ecologist. Lesley has a first-class honours degree in Zoology and a PhD in waterbird ecology (PhD Title: Ecological disturbance and its effects on estuarine benthic invertebrate communities and their avian predators).

Lesley has run the ecological consultancy 'Limosa Environmental' for the past 16 years. Lesley acts as Project Manager for each contract and over the years has gained considerable experience working on a range of contracts including Environmental Impact Assessments, Ecological Assessments (EcIA), Stage I Screening for Appropriate Assessment and Natura Impact Statements (NIS).

In addition, Lesley has worked part-time for BirdWatch Ireland since 2009, and from 2009 to 2014 was contracted to the National Parks and Wildlife Service (NPWS) as a Waterbird Ecologist. In this role, Lesley was responsible for the design and implementation of the NPWS baseline low tide waterbird survey programme and the preparation of site-specific Conservation Objectives for 32 coastal SPA sites. This work culminated in the publication of standard low-tide survey methods for waterbirds (Lewis & Tierney, 2014). From November 2014, Lesley was engaged in a number of BirdWatch Ireland projects including various aspects of the Irish Wetland Bird Survey (I-WeBS), as well as work on forestry birds, seabirds and the Hen Harrier. From September 2017, Lesley took over the management of both the Irish Wetland Bird Survey (I-WeBS) and the Countryside Bird Survey (CBS).