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SCREENING REPORT TO INFORM THE
APPROPRIATE ASSESSMENT PROCESS AND
NATURA IMPACT STATEMENT FOR
GLYNTOWN BRIDGE REHABILITATION

Prepared for: Cork City Council



Cork
City Council
Comhairle Cathrach Chorcaí

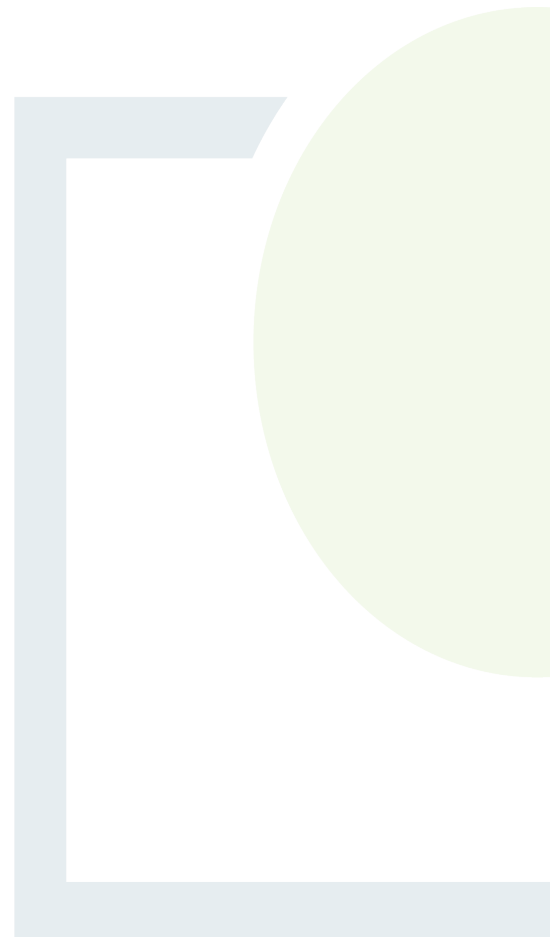
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Abstract: This document is prepared to inform the Competent Authority in carrying out their statutory obligations relating to the Habitats Directive requirement for Appropriate Assessment for plans and projects seeking consent. Appropriate Assessment is required under Article 6 (3) of the Habitats Directive for any project or plan that may give rise to significant effects on a European (Natura 2000) site.

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1. INTRODUCTION

Fehily Timoney and Company (FT) was commissioned by Cork City Council to provide consultancy services on the repair and rehabilitation of Glyntown Bridge in Glanmire. Glyntown Bridge crosses the Butlerstown River, located 9km to the east of Cork City Centre.

This report has been prepared to inform the competent authority in completing their statutory obligations in relation to Appropriate Assessment under Council Directive 92/43/EEC (Habitats Directive) as implemented in Ireland under *inter alia* the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended), and Part XAB of the Planning and Development Act, 2000 (as amended).

1.1 Legislative Context

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive) provides legal protection for habitats and species of European importance. The Directive requires that where a plan is likely to have a significant effect on a European Site, while not directly connected with or necessary to the nature conservation management of the site, it will be subject to 'Appropriate Assessment' to identify any implications for the European site in view of the site's Conservation Objectives. Specifically, Article 6(3) of the Habitats Directive states:

6(3) Any plan or project not directly connected with or necessary to the management of the site (Natura 2000 sites) but likely to have significant effect thereon, either individually or in combination with other plans or projects, shall be subject to Appropriate Assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.

The provisions of Article 6(3) do not apply where the proposed plan or project is '*connected with or necessary to the management of the site*'. In this case, the proposed project is not directly connected with or necessary to the management of any European site(s).

Article 6(3) of the Habitats Directive is implemented by the provisions of sections 177U and 177V of the *Planning and Development Act, 2000* (as amended). Article 177U requires that before consent is given, the competent authority must carry out a screening for appropriate assessment to assess, in view of best scientific knowledge, if the development, individually or in combination with another plan or project is likely to have a significant effect on the European site. If it cannot be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site, an appropriate assessment of its implications for the European Site(s) in view of the Site's conservation objectives is required to be carried out.

1.2 Statement of Competence

This report has been prepared by Kate Mahony, Jason Guile and David Daly of Fehily Timoney.



Kate Mahony is a Graduate Ecologist with Fehily Timoney. Kate holds a PhD in Zoology, MSc In Marine Biology and a BSc in Zoology from University College Cork. Kate has published research papers in peer-reviewed scientific journals and has a vast knowledge of Irish ecology and GIS. Kate is a Qualifying Member of the Chartered Institute of Ecology and Environmental Management (CIEEM). She has gained experience in Appropriate Assessment Screening reports and Natura Impact Statements for infrastructure projects at Fehily Timoney.

Jason is a Senior ecologist with Fehily Timoney and has over 10 years' experience in ecological assessment and holds a BSc in Marine Biology/Oceanography from the University of Wales, Bangor and a HND in Coastal Conservation with Marine Biology from Blackpool and Fylde College. Jason has a wide range of experience in the preparation of Environmental Impact Assessment Reports, Appropriate Assessment Screening reports and Natura Impact Statements. Jason was the lead ecologist on a range of projects in the UK, including large scale infrastructural schemes. Since moving to Ireland he has been lead ecologist / author (EIAR, AA Screening reports and NIS's) for a number of projects including historic landfill remediation works, urban planning applications and commercial regeneration sites. With FT, Jason is lead ecologist for a number of renewable energy projects.

David Daly MSc BSc is a project ecologist with Fehily Timoney who completed the ecological walkover of the site and compiled this report. A large portion of his work is focused on the survey and assessment of proposed renewable energy and waste sites. He has carried out comprehensive ecological work on several sites, from flora and fauna surveys and habitat mapping. David also has experience in Ecological Appraisals, AA Screening Reports, Natura Impact Statement and Ecological Enhancement Plans. David has carried out AA Screening/ NIS reports for projects such wind farm grid connections, maintenance works to buildings, construction of commercial units, planning for retention, landfill remediation works and forestry felling licences.

1.3 Methodology

1.3.1 [Guidance](#)

The assessment was conducted in accordance with the following guidance:

- *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*, Office for Official Publications of the European Communities, Luxembourg (European Commission, 2002)
 - This document was updated by *Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC*. Commission Notice (2021) Brussels, 28.9.2021 C(2021) 6913 final (European Commission, 2021)
- *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities*. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin (2009, updated 2010) (Environment Heritage and Local Government, 2010)
- *Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC*. European Commission (2019). Brussels, (2019/C 33/01). OJ C 33, 25.1.2019;
- *Interpretation Manual of European Union Habitats*. Version EUR 28. (European Commission, 2013)
- OPR Practice Note *PN01 Appropriate Assessment Screening for Development Management*, (Office of the Planning Regulator, 2021)



1.3.2 Process

The process of determining the likelihood of significant effects from a proposed project on European sites is an iterative process centred around a Source-Pathway-Receptor assessment.

The assessment commences with a description of the project and the associated likely significant environment effects. All elements of the project are presented including the project location and existing baseline environment. The type of impacts that are likely due to the project are identified having regard to the spatial and temporal scale of the project, resource requirements and likely emissions. The zone of influence (ZoI) of the project is therefore defined, and the potential source-pathway-receptor (S-P-R) connectivity to European Sites and their qualifying interests/special conservation interests are identified.

The potential for in-combination effects with other plans and projects is also assessed having regard to the identified impacts of the project.

The likelihood of significant effects of the European Sites within the ZoI is determined having regard to the sensitivity of the site to the impacts associated with the project on its own and in combination with other plans and projects.

Having regard to the European Commission Communication on the Precautionary Principle (European Commission, 2021) the:

“absence of scientific evidence on the significant negative effect of an action cannot be used as justification for approval of this action. When applied to Article 6(3) procedure, the precautionary principle implies that the absence of a negative effect on Natura 2000 sites has to be demonstrated before a plan or project can be authorised. In other words, if there is a lack of certainty as to whether there will be any negative effects, then the plan or project cannot be approved.”

Where significant effects are determined to be likely, or where there is uncertainty regarding the likelihood of significant effects, the project will be required under law to be subjected to Appropriate Assessment.

Section 3 of this report presents an assessment of whether the proposed repair and rehabilitation works is likely to have significant effects on European sites (either alone or in combination with other plans or projects). The Report has concluded potential for significant effects exists. As such, having regard to Article 177T(4) of the Planning and Development Act, 2000 (as amended) a Natura Impact Statement (NIS) will be required. The NIS is included in **Section 4** of this report.

The European Commission Notice (2019): ‘Managing Natura 2000 sites. The provisions of Article 6 of the ‘Habitats’ Directive 92/43/EEC’ prescribes the content of the Appropriate Assessment and notes the following:

- It must be ensured that the Appropriate Assessment addresses all elements contributing to the site’s integrity as specified in the site’s conservation objectives and Standard Data Form, and is based on the best available scientific knowledge in the field;
- the information required should be up-to-date;
- The Appropriate Assessment should also include a comprehensive identification of all the potential effects of the plan or project likely to be significant on the site, taking into account cumulative and other effects likely to arise as a result of the combined action of the plan or project under assessment with other plans or projects.
- It should apply the best available techniques and methods to assess the extent of the effects of the plan or project on the integrity of the site(s).



The NIS as presented has been developed to address these requirements so as to present sufficient and up to date information to allow the Competent Authority to give full consideration of all elements contributing to the site integrity and allowing identification of potential impacts, mitigation measures and residual impacts.

1.3.3 Information Consulted in the Preparation of this Report

A desk study was carried out to collate available information on the proposed project's natural environment. This comprised a review of the following publications, data and datasets:

- Draft Cork City Development Plan 2022-2028 (Cork City Council, 2021);
- Cork City Development Plan 2015-2021 (Cork City Council, 2015);
- Cork City Council Planning Enquiry System ¹
- Environmental Protection Agency (EPA) (on-line map-viewer including the Appropriate Assessment Tool)²
- Department of Housing, Planning, and Local Government – online land use mapping³
- Department of Housing, Planning, and Local Government- EIA Portal⁴
- National Parks and Wildlife Service – online European site network information, including site conservation objectives⁵
- National Parks and Wildlife Service – Information on the status of EU protected habitats and species in Ireland (including Article 17 and Article 12 Reports);
- National Biodiversity Data Centre⁶

¹ <https://www.corkcity.ie/en/council-services/services/planning/search-for-a-planning-application/> Accessed 29/08/2022

² <https://gis.epa.ie/EPAMaps/> Accessed 29/08/2022

³ www.myplan.ie Accessed 29/08/2022

⁴ <https://www.housing.gov.ie/planning/environmental-assessment/environmental-impact-assessment-eia/eia-portal> Accessed 29/08/2022

⁵ www.npws.ie Accessed 29/08/2022

⁶ www.biodiversityireland.ie Accessed 29/08/2022



2. DESCRIPTION OF THE PROJECT

2.1 Existing Environment

2.1.1 Project Location

Glyntown Bridge carries the L2998, East Cliff Road, over the Butlerstown River approximately 9km to the East of Cork City Centre. The year of construction is unknown. The structure is a 3-span masonry arch bridge. Glyntown Bridge carries vehicular and pedestrian traffic in the busy Glanmire townland. The bridge is situated approximately 50m east of the confluence of the Glashaboy River

The site is located in an urban area, in the vicinity of commercial units, residential estates, sports fields and wooded parklands.

2.1.2 Hydrology

The bridge is located in the Glashaboy[L.Mahon]_SC_010 subcatchment of the Irish River Network System, which is located in the Lee, Cork Harbour and Youghal Bay catchment. The bridge delineates two sub basins: Butlerstown_030 and Glashaboy (Lough Mahon)_030.

The Butlerstown River (Butlerstown 19) flows beneath the Glyntown Bridge, in a westerly direction. An EPA monitoring station is situated on the western side of the bridge. The latest Q Value for this station (assessed in 2020) was Q4-5 indicating High Ecological Water Quality. Approximately 50m east of the bridge, the Butlerstown River meets the Glashaboy River (Glashaboy [L.Mahon]). The Glashaboy River flows in an overall southerly direction for approx. 3.5km, where it meets the River Lee.

The bridge is located in the Ballinhassig East groundwater body.

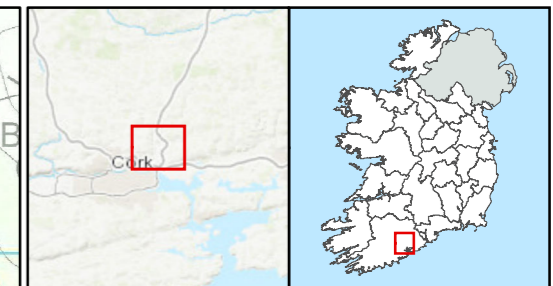
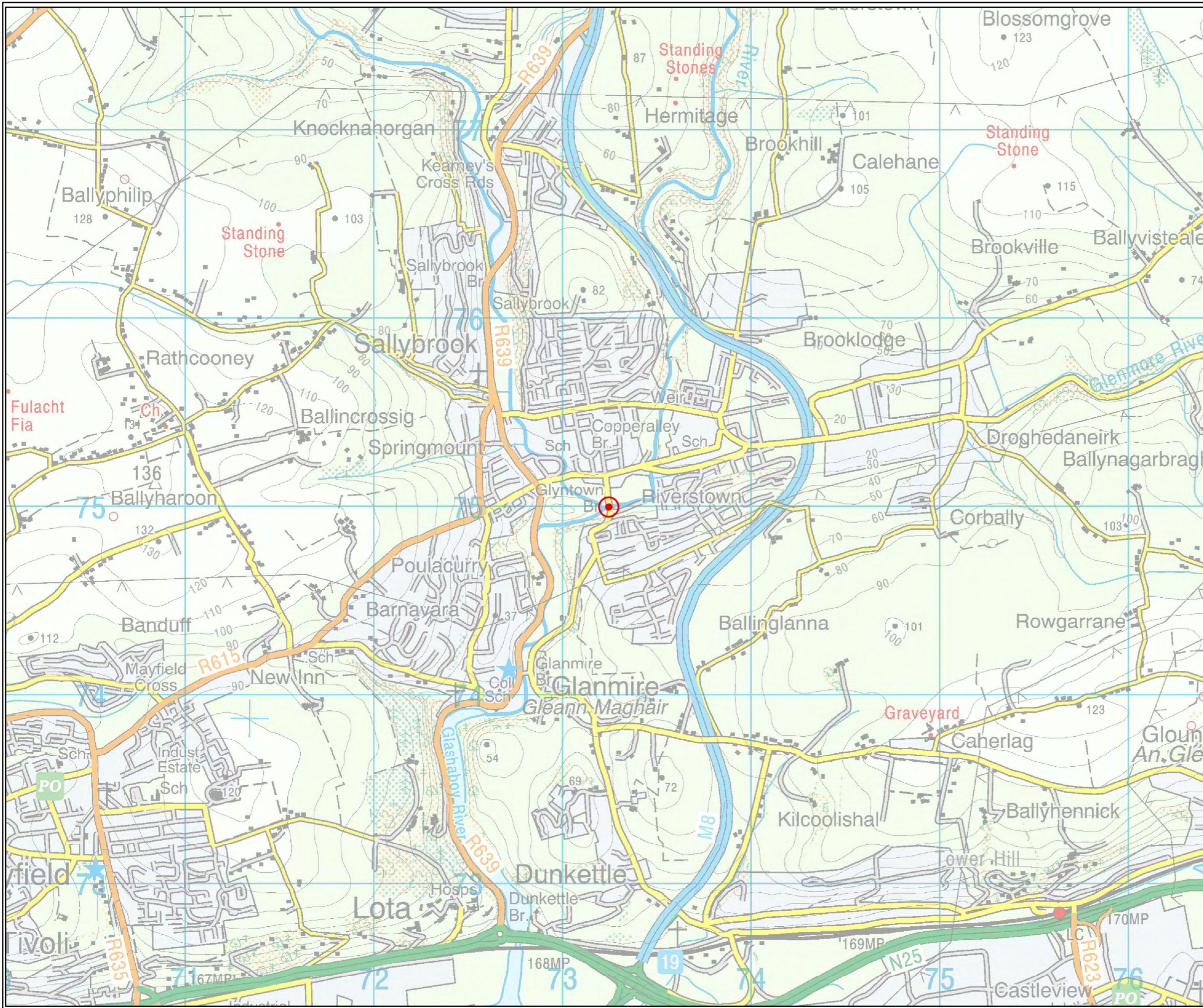
2.1.3 Habitats

The habitat surrounding the bridge and stream is predominantly broadleaved woodland (WD1) and hedgerows/treeline (WL1/WL2, Fossitt, 2000) Extending beyond these habitats, the surroundings included recolonising hardstanding areas, built land (roads and buildings) and amenity grassland.

The physical aquatic habitat upstream of the bridge is a substratum dominated by large cobbled with a lower proportion of gravels and some sand. The upstream flow type of the Butlerstown River is riffle. There is no siltation, a small amount of litter is present and shade is moderate.

2.1.4 Invasive Species

A number of invasive species were identified at the site by ecologist David Daly. Japanese knotweed, a high-impact invasive species, was recorded adjacent to the east facing of the bridge on the northern bank (ITM 573207 575067). *Buddleja* ran from the bridge easterly along the extent of the river to at least 100m upstream. Winter heliotrope was recorded in patches within the woodland and old man's beard along the hedgerows.



Legend
 Site Location

TITLE:	
Site Location	
PROJECT:	
Engineering Consultancy Services for Bridges (Glyntown)	
FIGURE NO: 2.1	
CLIENT: Cork Bridges	
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2.2 Project Description

The purpose of these works is the repair and rehabilitation of the existing structure of Glyntown Bridge. The description of the proposed project and details of the proposed stages are discussed below.

2.2.1 Construction Phase

2.2.1.1 *Temporary Site Facilities*

During the construction phase, temporary facilities will be provided to service the site and a maximum five to ten site personnel. A temporary site compound, requiring no permanent installations will be set up in the hardstanding area to the southeast of the bridge.

2.2.1.2 *Vegetation Removal*

Japanese knotweed is present on the northern bank to the east of the bridge. This will be treated as outlined in the Invasive Species Management Plan (Appendix 2). No works are proposed in the areas of the remaining invasive species.

The spandrel walls, wing walls, parapets and barrel arch will be cleared of vegetation and algae to allow for stonework repointing. The vegetation removed will be collected and disposed of offsite.

Tree trunks will be removed from or treated in-situ of the spandrel wall (Plate 2.1). In the case of treatment, targeted herbicide will be used. Where trees are to be removed, parapet demolition will be conducted to access the tree's root system. The parapets will be demolished using a pneumatic drill. Tree trunk removal will be undertaken with the use of chainsaws, to remove as much of the trunk as possible.



Source: Fehily Timoney

Plate 2-1: Glyntown Bridge viewed from upstream



2.2.1.3 Parapet Repair

Small sections of the parapet walls will require demolition to good stone sections and rebuilding. These include damaged parapet walls on traffic side of the northeast of the bridge (Japanese knotweed is not present on this side) and locations where tree trunks can be removed close to the carriageway level. These works will be conducted from the bridge deck.

The stone required for the repair of the parapet will be sourced from licenced quarries in the vicinity of the project and stone reutilised from on-site demolition. The stonework will be rebuilt with Natural Hydraulic Lime (NHL) 3.5 mortar to match the existing stonework. This lime and sand mix mortar will be mixed onsite.

2.2.1.1 Pier Cutwater Repair

The eastern cutwater is in very poor condition and will be replaced (Plate 2.1). The cutwater will be demolished down to good stone. If good stone cannot be located, then the cutwater will be underpinned with a concrete base using shuttering.

On top of the good stone/concrete foundation, the cutwater will be rebuilt. The stone required for the repair of the cutwater will be sourced from licenced quarries in the vicinity of the project and stone reutilised from on-site demolition of the original cutwater. The stonework will be rebuilt with mortar to match existing construction.

For these works, the river will need to be partially dammed (coffer dam of pea gravel bags and geosynthetic textile) to encourage the flow under the remaining arches. Cutwater repair will occur over a period of 2.5 weeks.

2.2.1.2 Repointing

The whole structure will be repointed (spandrel wall, wing walls, barrel arches and parapets). The repointing will require all loose mortar, soil and deleterious materials to be brushed out of the joint.

For the spandrel walls, wing walls, arch barrel and parapets, a natural hydraulic lime (NHL) mortar will be used. On the piers and abutments where water contact is more frequent, a more resistant NHL 5 mortar mix will be used.

2.2.1.3 Construction materials

The following details the construction materials and their volumes, to be used during the construction phase of the proposed project:

- Cast In-situ Concrete 3m³
- NHL Lime Mortar 1.5m³
- Stone for Repairs 3.5m³



2.2.2 Operational Phase

The operation of the structure is to remain as existing, serving circulatory vehicular and pedestrian traffic in and around the Glanmire area.

2.2.3 Decommissioning Phase

There is no plan for the decommissioning of the structure.

2.3 Potential Interactions of the Proposed Project with the Natural Environment

Having regard to the methodology set out in the updated guidance document '*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*', (European Commission, 2021), the likely impacts of the project are set out relative to the following project features:

- size (e.g. in relation to direct land-take);
- overall affected area including the area affected by indirect impacts (e.g. noise, turbidity, vibrations);
- physical changes in the environment (e.g. modification of riverbeds or morphology of other water bodies, changes in the density of forest cover);
- changes in the intensity of an existing pressure (e.g. increase in noise, pollution or traffic);
- resource requirements (e.g. water abstraction, mineral extraction);
- emissions (e.g. nitrogen deposition) and waste (and whether they are disposed of on land, water or in the air);
- transportation requirements (e.g. access roads);
- duration of construction, operation, decommissioning, etc.;
- temporal aspects (timing of the different stages of a plan or project);
- distance from Natura 2000 sites and in particular from their designating features;
- cumulative impacts with other projects and plans.

These project features are further examined in defining the likely Zone of Influence (ZoI) of the project and in determining likely significant effects through the Source-Pathway-Receptor assessment (Section 3).

All elements of the project as described in the previous section have been considered and everything not mentioned below has been considered and deemed to have no potential impact.



Table 2-1: Potential Impacts of the Proposed Project

Project Feature	Description	Potential Impact
Size Overall affected area including the area affected by indirect impacts Physical changes in the environment	<p>Construction will involve localised habitat loss through removal of vegetation on the bridge.</p> <p>Repair of the cutwater will require instream works.</p>	<p>Repair and rehabilitation of the bridge will result in the permanent removal of small, localised areas of trees and vegetation, but will remain within the bridge footprint. Therefore, changes to the environment are not a potential impact resulting from the proposed project.</p> <p>Damming will result in temporary alterations in river flow and disturbance of sediment in the immediate vicinity of the bridge. Ingress and egress of site personnel will result in localised disturbances to sediment on the riverbed. These impacts will be temporary (2.5 weeks) and the remaining river channel will accommodate flow.</p> <p>Refer to Emission to water for further detail.</p>
Resource Requirements	There are no resource requirements from European sites. The stone required for the repair of the parapet will be sourced from licenced quarries in the vicinity of the project and stone reutilised from on-site demolition.	There are no potential impacts associated with resource requirements.
Changes in the intensity of an existing pressure	There will be no changes in intensity of existing pressures at the bridge. The operation of the structure is to remain as existing, serving circulatory vehicular and pedestrian traffic in and around the Glanmire area.	There are no potential impacts associated with changes in the intensity of an existing pressure.
Emissions	Dust The principal sources of potential air emissions during the repair and rehabilitation of the bridge will be dust. This dust will arise from demolishing of the cutwater down to good stone, vegetation removal, and loading and unloading of aggregates and materials.	<p>The Institute of Air Quality Management ‘Guidance on the Assessment of dust from demolition and construction’ (Holman <i>et al.</i>, 2014) states that “<i>Dust can have two types of effect on vegetation: physical and chemical. Direct physical effects include reduced photosynthesis, respiration and transpiration through smothering. Chemical changes to soils or watercourses may lead to a loss of plants or animals for example via changes in acidity. Indirect effects can include increased susceptibility to stresses such as pathogens and air pollution. These changes are likely to occur only as a result of long-term demolition and construction works adjacent to a sensitive habitat. Often impacts will be reversible once the works are completed, and dust emissions cease</i>”. The guidance prescribes potential dust emission risk classes to ecological receptors. The guidance specifies that, for sensitive ecological receptors (i.e. European sites) sensitivity to dust is ‘High’ up to 20m from the source and reduces to ‘Medium’ over 50m from the source.</p> <p>Therefore, the proposed project has potential for disturbance due to dust.</p>
Emissions	Noise The main aspects of the construction phase, with the potential to generate noise include: <ul style="list-style-type: none"> • Delivery and set up of the temporary site compound; • Removal of tree trunks with chainsaws; • Parapet demolition; • Cutwater demolition and potential structural underpinning; • Delivery of construction materials, notably stone and concrete. 	<p>Disturbance to noise varies between species and is dependent on the nature of the noise source and sensitivity of the species e.g., the potential effects of anthropogenic sound on fish can range from direct mortality to no obvious behavioural responses and are dependent on the class of sound i.e., either continuous or impulsive (Popper and Hawkins, 2019). Similarly, the disturbance response of birds (e.g., becoming alert or a flight response) can vary depending on season, species sensitivity, and weather.</p> <p>The repair of the bridge has potential for noise disturbance of aquatic species along with bird species.</p>
Emissions	Water Pollution Vegetation clearance has the potential to contribute to an increase in runoff from project site. An increase in surface water runoff has the potential to result in increased sedimentation of the watercourse, the Butlerstown River. Mortar consisting of a mix of lime and sand will be utilised on stonework, which may enter the river during pointing and instream works. Concrete will be used for cutwater and could result in contamination of the river. Targeted herbicide will be used to remove trees, which may enter the watercourse.	<p>Sedimentation of watercourses from runoff has potential to degrade the quality of these watercourses and as such reduce the carrying capacity of the watercourses for aquatic species.</p> <p>The release of concrete to an aquatic environment can have the effect of altering the levels of pH, nitrate, phosphate, total solids, total suspended solids, total dissolved solids, turbidity and biological oxygen demand in the water. Cement products are particularly harmful to aquatic life due to the associated change in alkalinity in the water, which can cause burns to fish skin. Additionally, the lime-based mortar has the potential to alter pH of the river.</p> <p>Herbicide used for tree removal can be detrimental to flora and fauna in the aquatic environment in the event of contamination of the river.</p> <p>Therefore, the proposed project has potential for disturbance due to water pollution.</p>



Project Feature	Description	Potential Impact
Emissions	<p>Invasive Species</p> <p>Japanese knotweed is present on the bank to the northeast of the bridge.</p> <p>Pneumatic drills, crane, and dumpers will be utilised during works.</p>	<p>There is a risk that machinery associated with construction and movement of personnel could act as a vector for introducing or dispersing non-native invasive species, within the adjacent watercourse or to offsite locations.</p> <p>Therefore, the proposed project has potential for impacts due to invasive species.</p>
Wastes and residues	<p>Waste Emissions</p> <p>The contractor compound is to have mess facilities, toilet and waste receptacles. All site compound waste is to be stored and disposed of by the contractor to a licensed facility.</p>	<p>As all waste will be disposed of to a licensed facility, there are no potential impacts associated with waste emissions.</p>
Transportation requirements	<p>Existing road access to the locations upstream and downstream of the bridge are to be utilised. No alterations to these existing accesses will occur.</p>	<p>No potential impacts are identified as a result of transportation requirements.</p> <p>The increase in traffic volumes fall below the screening criteria set out in the UK Design Manual for Roads and Bridges guidance. The guidance states that road links meeting one or more of the following criteria can be defined as being 'affected' by a project and should be included in the local air quality assessment:</p> <ul style="list-style-type: none"> • Road alignment change of 5 metres or more; • Daily traffic flow changes by 1,000 AADT or more; • HGVs flows change by 200 vehicles per day or more; • Daily average speed changes by 10 km/h or more; or • Peak hour speed changes by 20 km/h or more.
<p>Duration of construction, operation, decommissioning</p> <p>Temporal Aspects</p>	<p>The construction phases will last for a period of one to two months. During the operational phase, staff will access the site approximately once per year.</p>	<p>There is potential for displacement of QI species (i.e. otter) due to disturbance during key seasonal stages of the life cycle during construction. Disturbance to otter can occur up to 150m from the proposed works area (National Roads Authority, 2008).</p> <p>Potential for seasonal displacement of birds due to disturbance. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway, 1997).</p>
Distance from Natura 2000 sites	<p>There are no European sites geographically overlapping with the bridge and location of works. There are three Natura sites within proximity of the proposed works, Great Island Channel SAC (001508), Blackwater River (Cork/Waterford) SAC (002170), and Cork Harbour SPA (004030)</p>	<p>There is a potential for impacts due to the proximity of the works to Natura 2000 sites.</p>
Cumulative impacts with other projects and plans	<p>The potential impacts of the proposed project are considered in combination with other plans or projects within the zone of influence (refer to Table 3.1 below). This is to determine plans or projects that clearly have no connectivity to a European site's qualifying interests/special conservation interests or where it can be excluded that there will be no likely significant effects on the conservation objectives for the site's Qis/SCIs.</p> <p>The projects that have no connectivity/will not undermine the European site's conservation objectives have been ruled out for assessment (refer to Appendix 1 for a full list of projects). All other plans or projects, including those where there is reasonable doubt as to the magnitude and nature of their impact to a European site's QI/SCIs and conservation objectives, are carried through to the next stage of assessment (Section 4).</p> <p>The plans and projects carried through to the next stage of assessment are outlined below. They have potential for in-combination effects with the proposed project due to the size, scale and/or potential connectivity to the proposed project or European site's within the zone of influence (refer to Table 3.1 below) of the proposed project.</p> <p><i>Large Scale Projects</i></p> <p>Large scale and infrastructure projects within the planning application in the past five years with connectivity to the Butlerstown River and Glashaboy River include:</p>	<p>There is potential for cumulative effects from other developments in combination with the bridge repair. If the repairs of the bridge happen in parallel with other plans or projects, contribution of suspended solids/pollutants to the Butlerstown River could have detrimental impacts.</p> <p>Additionally, there is potential for cumulative effects from other developments and plans in relation to invasive species. If invasive species are spread from other developments and plans in parallel with the proposed project, there could be detrimental impacts downstream of Butlerstown River and its banks.</p>



Project Feature	Description	Potential Impact
	<ul style="list-style-type: none"> • Glashaboy River (Glanmire/Sallybrook) Drainage Scheme; • Dunkettle Interchange Upgrade; • Residential development of 30 no. houses. <p><i>Small Scale Projects</i></p> <p>The majority of consent applications pertain to one-off residential dwelling, change of use and small structures. The individual projects may not have potential for in-combination effects with the proposed project, however, cumulatively there is potential for in-combination effects with the proposed project.</p> <p><u>Plans</u></p> <ul style="list-style-type: none"> • Draft Cork City Development Plan 2022-2028 (Cork City Council, 2021); • Cork City Development Plan 2015-2021 (Cork City Council, 2015). 	



3. SCREENING FOR APPROPRIATE ASSESSMENT

3.1 Introduction

This section of the report is to inform the Competent Authority in their determination of if the proposed project is likely to have a significant effect upon European sites, either alone or in combination with other plans or projects.

The proposed project is not directly connected with or necessary to the management of a European Site.

3.2 Identification of European Sites that may be affected by the Proposed Project

European Commission Notice (2021) on the 'Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC, states that in identifying European sites (Natural 2000 sites), which may be affected by the project, the following should be identified:

- Any European sites geographically overlapping with any of the actions or aspects of the plan or project in any of its phases, or adjacent to them
- Any European sites within the likely zone of influence of the plan or project. European sites located in the surroundings of the plan or project (or at some distance) that could still be indirectly affected by aspects of the project, including as regards the use of natural resources (e.g., water) and various types of waste, discharge or emissions of substances or energy
- European sites whose connectivity or ecological continuity can be affected by the plan or project.

There are no European sites geographically overlapping with the bridge and location of works.

The European sites within the likely zone of influence (Zoi) of the project were identified having regard to CIEEM (2018) 'Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine'. This guideline defines the Zoi as "... the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities." The likely spatial and temporal biophysical changes associated with the impacts (which was determined with reference to relevant published literature and guidance documents) are set out in Table 2.1. However, as a precautionary approach in defining the ecological features that may be affected, an initial buffer of 15km was first examined using Geographic Information System (GIS) mapping (refer to Figure 3.1) and the conservation interests of these European sites were examined in order to ascertain whether there could be potential physical or ecological connectivity to the project and the associated likely project impacts. Additionally, any European sites beyond the initial 15km buffer with hydrological or physical connectivity were also identified for further examination. The findings of the Zoi assessment are presented in Table 3.1.



Table 3-1: European Sites Within the Potential Zol

European Site (code)	List of Qualifying Interest/Special Conservation Interest	Distance from Proposed Project (km)	Pathway	Considered further in screening Y/N
Cork Harbour SPA (004030) Conservation Objectives: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004030.pdf Accessed 31/08/2022	Little Grebe (<i>Tachybaptus ruficollis</i>) [A004] Great Crested Grebe (<i>Podiceps cristatus</i>) [A005] Cormorant (<i>Phalacrocorax carbo</i>) [A017] Grey Heron (<i>Ardea cinerea</i>) [A028] Shelduck (<i>Tadorna tadorna</i>) [A048] Wigeon (<i>Anas penelope</i>) [A050] Teal (<i>Anas crecca</i>) [A052] Pintail (<i>Anas acuta</i>) [A054] Shoveler (<i>Anas clypeata</i>) [A056] Red-breasted Merganser (<i>Mergus serrator</i>) [A069] Oystercatcher (<i>Haematopus ostralegus</i>) [A130] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Grey Plover (<i>Pluvialis squatarola</i>) [A141] Lapwing (<i>Vanellus vanellus</i>) [A142] Dunlin (<i>Calidris alpina</i>) [A149] Black-tailed Godwit (<i>Limosa limosa</i>) [A156] Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] Curlew (<i>Numenius arquata</i>) [A160] Redshank (<i>Tringa totanus</i>) [A162] Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] Common Gull (<i>Larus canus</i>) [A182] Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183] Common Tern (<i>Sterna hirundo</i>) [A193] Wetland and Waterbirds [A999]	1.3km Direct Distance 1.8km Instream Distance	A number of SCI species have potential to occur in the habitats adjacent to the proposed project, given the foraging and migratory ranges of the species (e.g., Johnson, Schmidt and Taylor, 2014; Scottish Natural Heritage, 2016), as well as typical habitat types for these species. Additionally, there is potential for disturbance during the breeding season. There is hydrological connectivity between the proposed project and SPA. This may result in potential impacts for the SCI Wetlands and Waterbirds. Therefore, Cork Harbour SPA is within the Zol of the proposed project.	Y
Great Island Channel SAC (001058) Conservation Objectives: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001058.pdf Accessed 31/08/2022	Mudflats and sandflats not covered by seawater at low tide [1140] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330]	3.6km Direct Distance	The Great Island Channel SAC overlaps a portion of Cork Harbour SPA. However, the Butlerstown/Glashaboy River does directly enter the Great Island Channel SAC. Both the SAC and Butlerstown/Glashaboy River enter the Cork Harbour estuarine area (i.e. hydrological connectivity), however due to the unlikelihood of mixing of these watercourses within the SAC, and frequent tidal flushing, this SAC is not determined to be in the Zol of the project.	N
Blackwater River (Cork/Waterford) SAC (002170) Conservation Objectives: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002170.pdf Accessed 31/08/2022	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Perennial vegetation of stony banks [1220] Salicornia and other annuals colonising mud and sand [1310]	11.8km Direct Distance	The Blackwater River (Cork/Waterford) SAC lies in different catchment to the Glyntown Bridge (Blackwater (Munster)). There is no hydrological connectivity between this European Site and the proposed project, therefore it is determined that this SAC is not in the Zol of the project.	N

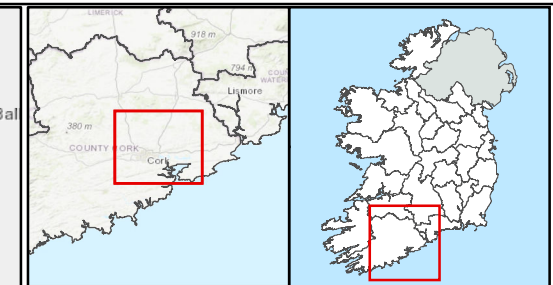
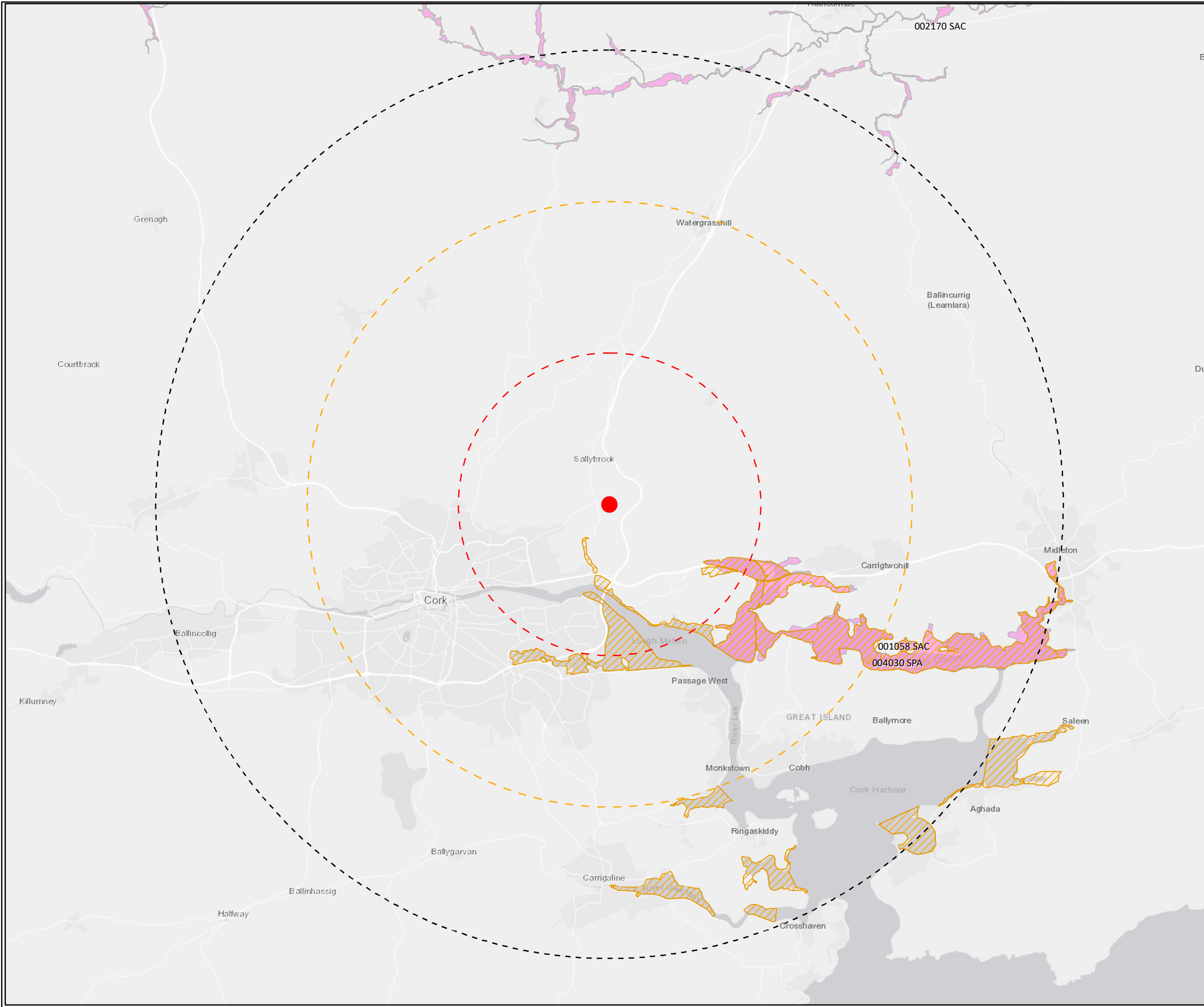


European Site (code)	List of Qualifying Interest/Special Conservation Interest	Distance from Proposed Project (km)	Pathway	Considered further in screening Y/N
	<p>Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029] <i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092] <i>Petromyzon marinus</i> (Sea Lamprey) [1095] <i>Lampetra planeri</i> (Brook Lamprey) [1096] <i>Lampetra fluviatilis</i> (River Lamprey) [1099] <i>Alosa fallax fallax</i> (Twaiite Shad) [1103] <i>Salmo salar</i> (Salmon) [1106] <i>Lutra lutra</i> (Otter) [1355] <i>Trichomanes speciosum</i> (Killarney Fern) [1421]</p>			



Having further examined the likely spatial and temporal biophysical changes associated with the project impacts, it was determined that Cork Harbour SPA is within the Zol of the proposed project.

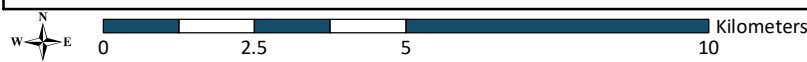
Once the Zol is defined, an assessment must be made of the sensitivity of the qualifying interests to such impacts and as such the potential for significant effects. To that end, a 'Source-Pathway-Receptor' model was applied to determine if this European site will be significantly affected having regard to the pathway for impact and the sensitivity of the Special Conservation Interests to the effect of the impact (Table 3.2).



Legend

- Site Location
- 5km Distance Band
- 10km Distance Band
- 15km Distance Band
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)

TITLE:	European Sites within proximity of the Proposed Development		
PROJECT:	Engineering Consultancy Services for Bridges (Glyntown)		
FIGURE NO.:	3.1		
CLIENT:	Cork City Council		
SCALE:	1:124836	REVISION:	1
DATE:	31/08/2022	PAGE SIZE:	A3





3.3 Assessment of Likely Significant Effects

3.3.1 Source-Pathway-Receptor Assessment and Potential for Significant Effects

The Office of the Planning Regulator's Practice Note PN01 recommends that the zone of influence of a project should be considered using the Source-Pathway-Receptor model.

European sites that potentially may be significantly affected by the proposed project are identified using the 'source-pathway-receptor' (S-P-R) conceptual model. The S-P-R model is a standard tool in environmental assessment to determine links between sensitive features and sources of impacts. In order for an effect to occur, all three elements of this mechanism must be in place. The absence of one of the elements of the mechanism means there is no likelihood for the effect to occur, e.g., if there is no ecological pathway or functional link between the proposed development and the European site, there is no potential for impact and as such no potential for significant effects.

An impact may occur without having a significant effect. An impact is essentially the 'source' in the S-P-R assessment. It is the biophysical change caused to the environment by the project e.g., increase in sediment runoff due to ground disturbance. For the effect to be significant, the Qualifying Interests/Special Conservation Interests of the European site must be sensitive to the biophysical change. The likely impacts of the proposed project are set out in Section 2.3 of this report. The European sites within the Zone of Influence of these impacts are determined as outlined in Section 3.2. The potential for the proposed project to have significant effects on the Cork Harbour SPA are assessed hereunder on the basis of the source-pathway-receptor connectivity, and the sensitivity of the European sites qualifying interests to the effects of the impacts (Table 3.2).



Table 3-2: Potential for Likely Significant Effects on the Cork Harbour SPA from the proposed project

Source	Pathway	Receptor	Likely Significant Effects
<p>Dust Emissions</p> <p>The Institute of Air Quality Management 'Guidance on the Assessment of dust from demolition and construction' (Holman <i>et al.</i>, 2014) states that "Dust can have two types of effect on vegetation: physical and chemical. Direct physical effects include reduced photosynthesis, respiration and transpiration through smothering. Chemical changes to soils or watercourses may lead to a loss of plants or animals for example via changes in acidity. Indirect effects can include increased susceptibility to stresses such as pathogens and air pollution. These changes are likely to occur only as a result of long-term demolition and construction works adjacent to a sensitive habitat. Often impacts will be reversible once the works are completed, and dust emissions cease". The guidance prescribes potential dust emission risk classes to ecological receptors. The guidance specifies that, for sensitive ecological receptors (i.e. European sites) sensitivity to dust is 'High' up to 20m from the source and reduces to 'Medium' over 50m from the source. Therefore, the proposed project has potential for disturbance due to dust.</p>	<p>One of the identified pathways is the Butlerstown River, which meets the Glashaboy River 50m downstream. The Glashaboy River ultimately flows into the Cork Harbour SPA 1.8km downstream.</p> <p>There is physical connectivity between and the proposed project and Cork Harbour SPA. The SPA is designated for Wetlands and Waterbirds and has a number of bird species of Special Conservation Interest.</p>	<p>Given the impact pathway is a hydrological one, the Special Conservation Interests of the Cork Harbour SPA may be vulnerable to the impacts of dust (Holman <i>et al.</i>, 2014). As the SPA is beyond this distance, there is no potential for effects to the SPA.</p> <p>There may be indirect impacts to SCI species and habitats due to dust entering the watercourse (Refer to water emissions section below).</p>	<p>Likely Significant Effects</p>
<p>Noise Emissions</p> <p>Disturbance to noise varies between species and is dependent on the nature of the noise source and sensitivity of the species e.g., the potential effects of anthropogenic sound on fish can range from direct mortality to no obvious behavioural responses and are dependent on the class of sound i.e., either continuous or impulsive (Popper and Hawkins, 2019). Similarly, the disturbance response of birds (e.g., becoming alert or a flight response) can vary depending on season, species sensitivity, and weather.</p> <p>The repair of the bridge has potential for noise disturbance of aquatic species along with bird species.</p>	<p>Disturbance to noise varies between species and is dependent on the nature of the noise source and sensitivity of the species. However, levels of noise to be produced will not reach the Cork Harbour SPA therefore there is no direct pathway.</p> <p>There is an indirect physical pathway via the SCI species of the SPA. Noise impacts to bird species can occur up to 500m from the source, and may have indirect impacts to species utilising the surrounding landscapes of the bridge. There is also potential for impacts on breeding birds. However, the Glyntown Bridge is a noisy site due to traffic. Additional noise will be localised and of a short duration (1-2 months) therefore there is no potential for indirect effects to the SPA via SCI species utilising the project site.</p>	<p>No receptor</p>	<p>No Likely Significant Effects</p>
<p>Emissions to Water</p> <p>Sedimentation of watercourses from runoff has potential to degrade the quality of these watercourses and as such reduce the carrying capacity of the watercourses for aquatic species.</p> <p>The release of concrete to an aquatic environment can have the effect of altering the levels of pH, nitrate, phosphate, total solids, total suspended solids, total dissolved solids, turbidity and biological oxygen demand in the water. Cement products are particularly harmful to aquatic life due to the associated change in alkalinity in the water, which can cause burns to fish skin. Additionally, the lime-based mortar has the potential to alter pH of the river.</p> <p>Herbicide used for tree removal can be detrimental to flora and fauna in the aquatic environment in the event of contamination of the river.</p> <p>Therefore, the proposed project has potential for disturbance due to water pollution.</p>	<p>The identified pathway is the Butlerstown River, which meets the Glashaboy River 50m downstream. The Glashaboy River meets the Cork Harbour SPA 1.8km downstream.</p> <p>In addition to the hydrological pathway, there is also an indirect physical pathway via mobile species within the river.</p> <p>The Cork Harbour SPA is designated for Wetlands and Waterbirds and has a number of bird species of Special Conservation Interest.</p>	<p>Given that the impact pathway is a hydrological and physical one, the SCIs of the Cork Harbour SPA which may be vulnerable to such impacts are the aquatic habitats and species.</p> <p>The Cork Harbour SPA is designated for Wetlands and Waterbirds, which require particular environmental conditions such as physical habitat structure and water quality to support their conservation objectives within the SPA. This European site has a number of bird species of Special Conservation Interest. The release of sediment or pollutants to the watercourse network could potentially indirectly impact the attributes needed to support the SCIs.</p>	<p>Likely Significant Effects</p>



Source	Pathway	Receptor	Likely Significant Effects
<p>Emissions: Invasive Species</p> <p>There is a risk that machinery associated with construction and movement of personnel could act as a vector for introducing or dispersing non-native invasive species, within the adjacent watercourse or to offsite locations.</p> <p>Therefore, the proposed project has potential for impacts due to invasive species.</p>	<p>The identified pathway is the Butlerstown River, which meets the Glashaboy River 50m downstream. The Glashaboy River ultimately flows into the Cork Harbour SPA 1.8km downstream.</p>	<p>The Cork Harbour SPA is designated for Wetlands and Waterbirds and requires particular environmental conditions such as physical habitat structure and water quality to support their conservation objectives within the SPA. Physical habitat structure could potentially be impacted due to invasive species introduction to the SPA.</p>	<p>Likely Significant Effect</p>
<p>Duration of construction, operation, decommissioning/Temporal Aspects</p> <p>There is potential for displacement of QI species (i.e. otter) due to disturbance during key seasonal stages of the life cycle during construction. Disturbance to otter can occur up to 150m from the proposed works area (National Roads Authority, 2008).</p> <p>Potential for seasonal displacement of birds due to disturbance. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway, 1997).</p>	<p>While otter is not a QI species for Cork Harbour SPA, bird species have a physical pathway to the site of proposed works. The identified pathway is the Butlerstown River, which meets the Glashaboy River 50m downstream. The Glashaboy River ultimately flows into the Cork Harbour SPA 1.8km downstream.</p>	<p>Bird SCIs within Cork Harbour SPA, which have connectivity with the site of proposed works may be impacted due to disturbance during works during foraging, nesting or roosting.</p>	<p>Likely Significant Effects</p>
<p>Distance from Natura 2000 Sites</p> <p>There is a potential for effects due to the proximity of the works to Natura 2000 sites.</p>	<p>The identified pathway is the Butlerstown River, which meets the Glashaboy River 50m downstream. The Glashaboy River meets the Cork Harbour SPA 1.8km downstream.</p> <p>In addition to the hydrological pathway, there is also an indirect physical pathway via mobile species within the river.</p>	<p>The Cork Harbour SPA is designated for Wetlands and Waterbirds, which require particular environmental conditions such as physical habitat structure and water quality to support their conservation objectives within the SPA. This European site has a number of bird species of Special Conservation Interest. The release of sediment, invasive species, pollutants, dust emissions (all discussed above) to the watercourse network could potentially indirectly impact the attributes needed to support the SCIs.</p>	<p>Likely Significant Effects</p>
<p>Cumulative Impacts with other projects and plans</p> <p>There is potential for cumulative effects from other developments in combination with the bridge repair. If the repairs of the bridge happen in parallel with other plans or projects, contribution of suspended solids/pollutants to the Butlerstown River could have detrimental impacts.</p> <p>Additionally, there is potential for cumulative effects from other developments and plans in relation to invasive species. If invasive species are spread from other developments and plans in parallel with the proposed project, there could be detrimental impacts downstream of Butlerstown River and its banks.</p>	<p>The identified pathway is the Butlerstown River, which meets the Glashaboy River 50m downstream. The Glashaboy River meets the Cork Harbour SPA 1.8km downstream.</p> <p>In addition to the hydrological pathway, there is also an indirect physical pathway via mobile species within the river.</p>	<p>Given that the impact pathway is a hydrological and physical one, SCIs of the Cork Harbour SPA which may be vulnerable to such impacts are the aquatic habitats and species.</p> <p>The Cork Harbour SPA is designated for Wetlands and Waterbirds and requires particular environmental conditions such as physical habitat structure and water quality to support their conservation objectives within the SPA. This European site has a number of bird species of Special Conservation Interest. The release of sediment, pollutants or invasive species to the watercourse network could potentially impact the attributes needed to support the qualifying interests.</p>	<p>Likely Significant Effects</p>



3.4 Screening Conclusion

Likely significant effects have been identified to Cork Harbour SPA as a result of both direct and indirect effects from the proposed project. These effects may occur alone or in-combination with other plans and projects. In the absence of mitigation measures (which have not been considered at this screening stage), likely significant effects on the Special Conservation Interests of the Cork Harbour SPA cannot be excluded on the basis of objective scientific information. This screening exercise concludes that an appropriate assessment will be required.

A Natura Impact Statement has been completed (See Section 4) for Cork Harbour SPA (004030).

No pathways for likely significant effects on any other European sites, were identified. Therefore, it is concluded beyond reasonable scientific doubt, in view of best scientific knowledge on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the proposed repair and rehabilitation of Glyntown Bridge, individually or in combination with other plans and projects, will not have a likely significant effect on the following sites (or any other European sites):

- Great Island Channel SAC (001508);
- Blackwater River (Cork/Waterford) SAC (002170).

Therefore, these sites have been 'Screened Out' in the screening stage of the AA process.



4. NATURA IMPACT STATEMENT

4.1 Introduction

The screening assessment (Section 3 of this report), which was carried out to determine the likelihood of significant effects on European sites from the proposed project, has concluded as follows:

In the absence of mitigation measures (which have not been considered at the screening stage), likely significant effects of the proposed project, individually or in combination with other plans or projects on the special conservation interests of the Cork Harbour SPA, cannot be excluded on the basis of objective scientific information.

Likely significant effects have been identified due to:

- Emissions (dust, water, invasive species);
- Temporal Aspects;
- Distance from Natural 2000 sites;
- Cumulative impacts with other projects and plans.

Further consideration is given in this Natura Impact Statement (NIS) to the elements of the proposed project that might have adverse effects on the integrity of Cork Harbour SPA with respect to site's conservation objectives.

Refer to Section 2 for the project description and baseline environment.

4.2 European Sites Description

4.2.1 Cork Harbour SPA

Cork Harbour SPA encompasses most of the intertidal areas in Cork Harbour, a large, sheltered bay. Cork Harbour is fed by several river estuaries, principally the Lee, Douglas, Owenboy and Owennacurra. Due to its sheltered conditions, the intertidal flats are typically muddy and support a range of macro-invertebrates and green algae.

This SPA is an internationally important wetland, supporting internationally important populations of black-tailed godwit and redshank. The site also has nationally important populations of little grebe, great crested grebe, cormorant, grey heron, shelduck, wigeon, teal, mallard, pintail, shoveler, red-breasted merganser, oystercatcher, golden plover, grey plover, lapwing, dunlin, bar-tailed godwit, curlew and greenshank. A nationally important breeding colony of common tern exists at the site. This SPA is also utilised by mute swan, whooper swan, pochard, gadwall, tufted duck, goldeneye, coot, ringed plover, knot, turnstone, black-headed gull, common gull, lesser black-backed gull, ruff, spotted redshank and green sandpiper.

The main threats and pressures that may impact the Cork Harbour SPA are set out in the Natura 2000 Data Form (NPWS, 2020) and are presented in Table 4-1.



Table 4-1: Threats, Pressures and Activities with Impacts on the Cork Harbour SPA

High Level (inside site)	High Level (outside site)	Medium Level (inside site)	Medium Level (outside site)	Low Level (inside site)	High Level (outside site)
F01: Marine and Freshwater Aquaculture	D03.01: Port areas	D03.02: Shipping lanes	A08: Fertilisation	N/A	E01.03: Dispersed habitation
E01: Urbanised area, human habitation	D01.02: Road, motorways	G01.01: Nautical sports			
	E02: Industrial or commercial areas	G01.02: Walking, horse-riding and non-motorised vehicles			
		F02.03: Leisure Fishing			
		G01.06: Skiing, off-piste			

Source: Cork Harbour SPA (004030) Natural 2000 Data Form <https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF004030.pdf> Accessed 31/08/2022

4.2.2 Desk Study

A desk study of the conservation interests of the Cork Harbour SPA was conducted, assessing historical records from the NBDC and data supporting the conservation objectives of the European site.⁷

⁷ Biodiversity Map Viewer <https://maps.biodiversityireland.ie/Map> Accessed 16/08/2022



Table 4-2: Summary of Occurrences of Qualifying Interests within the W77 Grid Square

Special Conservation Interest	Item Description	Occurrence in Grid Square W77 (Date of last record)
A004	Little Grebe (<i>Tachybaptus ruficollis</i>)	2020
A005	Great Crested Grebe (<i>Podiceps cristatus</i>)	2011
A017	Cormorant (<i>Phalacrocorax carbo</i>)	2016
A028	Grey Heron (<i>Ardea cinerea</i>)	2020
A048	Shelduck (<i>Tadorna tadorna</i>)	2021
A050	Wigeon (<i>Anas penelope</i>)	2017
A052	Teal (<i>Anas crecca</i>)	2020
A054	Pintail (<i>Anas acuta</i>)	No records
A056	Shoveler (<i>Anas clypeata</i>)	2011
A069	Red-breasted Merganser (<i>Mergus serrator</i>)	2011
A130	Oystercatcher (<i>Haematopus ostralegus</i>)	2020
A140	Golden Plover (<i>Pluvialis apricaria</i>)	2017
A141	Grey Plover (<i>Pluvialis squatarola</i>)	2011
A142	Lapwing (<i>Vanellus vanellus</i>)	2017
A149	Dunlin (<i>Calidris alpina</i>)	2017
A156	Black-tailed Godwit (<i>Limosa limosa</i>)	2017
A157	Bar-tailed Godwit (<i>Limosa lapponica</i>)	2016
A160	Curlew (<i>Numenius arquata</i>)	2020
A162	Redshank (<i>Tringa totanus</i>)	2020
A179	Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	2020
A182	Common Gull (<i>Larus canus</i>)	2016
A183	Lesser Black-backed Gull (<i>Larus fuscus</i>)	2016
A193	Common Tern (<i>Sterna hirundo</i>)	2020
A999	Wetland and Waterbirds	NA

Having regard to the special conservation interests of Cork Harbour SPA that may potentially be within the zone of influence of the bridge repair and rehabilitation, due to possible presence in the Glashaboy estuary area all species/habitats listed in Table 4.2.



4.3 Cumulative Effects

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

“Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives”.

It is therefore required that the potential adverse effects of the proposed project are considered in combination with any other plans or projects within the zone of influence.

4.3.1.1 Projects with Potential for In-Combination Effects with the Proposed Project

The plans and projects outlined below have potential for in-combination effects with the proposed project due to the size, scale and/or potential connectivity (pathway) to the proposed project (refer to Table 3.2).

The following sources were examined:

- Cork City Council planning viewer⁸
- An Bord Pleanála website (Strategic infrastructure development (SID) applications, Strategic Housing Development (SHD) applications and project applications including wind farms and planning appeals⁹
- Department of Department of Housing, Local Government and Heritage’s EIA Portal¹⁰

If the construction phase of the proposed project was to occur in parallel with other plans or projects, in-combination impacts may occur on the special conservation interests of Cork Harbour SPA (refer to Table 4.2).

Sections 4.3.1.2 and 4.3.1.3 below detail the projects that were identified for having potential for in-combination effects on the Cork Harbour SPA with the proposed project.

4.3.1.2 Projects with Connectivity to the Butlerstown River and Glashaboy River

The closest large-scale project to Glyntown Bridge is a residential development of 30 no. houses and demolition of an existing dwelling and garage (planning reference 2039719). This development is 1km south-southwest of Glyntown Bridge. No appropriate assessment was available online for the site; however permission was granted under conditions including adequate waste disposal, keeping surface water free of herbicides, pesticides, fertilisers and other harmful substances, and ensuring no negative environmental impacts including dust surface water runoff, fuels and oils.

Therefore, no potential for significant in-combination / cumulative effects to occur with the proposed project.

⁸ <https://www.corkcoco.ie/en/planning/planning-enquiry-online-submissions> Accessed 29/08/2022

⁹ <https://www.pleanala.ie/en-ie/home>; Accessed 29/08/2022

¹⁰ <https://www.gov.ie/en/publication/9f9e7-eia-portal/> Accessed 29/08/2022



4.3.1.3 All Other Developments

A large-scale infrastructure project is ongoing at Dunkettle Roundabout. The proposed development involves the reconfiguration of the existing Interchange to a flowing interchange, including the following elements of infrastructure¹¹:

- A series of direct road links between the N8, the N25 and the N40 and links to the R623 Regional Road in Little Island and Bury's Bridge in Dunkettle;
- 1 grade separated junction arrangement at the existing N25 to the east of the existing Dunkettle Interchange;
- 4 roundabouts – 2 at the grade separated junction and 2 at tie-ins with the existing road network
- 52 structures of various forms;
- Several culverts where the scheme crosses watercourses or intertidal areas;
- Intelligent Transport Systems;
- Pedestrian and cyclist facilities.

Appropriate Assessment for this project was conducted, an NIS concluded with proposed mitigation, that the project will not have any impacts on any European sites. Additionally, due to the dilution and tidal nature of Cork Harbour, there is no potential for in-combination effects with the works at Glyntown Bridge.

4.3.1.4 Plans

Cork City Development Plan

The City Development Plan is currently under review. The Proposed Cork City Development Plan 2022-2028 has recently been published and will ultimately replace the Cork City Development Plan 2015-2021 once adopted.

The current plan includes several policies for the protection of wildlife and European sites, encouraging the appropriate assessment of potential effects from future development. The implementation of the policies and objectives of the County Development Plan in-combination with the design of the proposed project would have a positive effect for biodiversity in the local area.

Without mitigation the proposed project could adversely affect the integrity of a European site therefore, it would be contrary to the policies and objectives of the aforementioned plans in the absence of mitigation.

4.4 Potential For Adverse Effects on Site Integrity

The potential for the proposed project (in the absence of mitigation) to have an adverse effect on the integrity/conservation objectives of the Cork Harbour SPA (004030), is identified in Section 2.3.

¹¹ Dunkettle Interchange <https://www.dunkettle.ie/Dunkettle-Interchange> Accessed 29/08/2022



The conservation conditions required by these species are defined by attributes and targets set out in the Conservation Objectives Reports. No other special conservation interests of Cork Harbour SPA were determined to be within the zone of influence of the proposed project having regard to the potential for the affected areas to support the special conservation interests.

NPWS, in their Article 17 reporting (NPWS, 2019) define the favourable conservation status of an Annex I habitat as achieved when:

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

The favourable conservation status of an Annex II species (Habitats Directive) and Annex I species (Birds Directive) is achieved through the maintenance or restoration of conservation status according to the Conservation Objectives of the site.

4.4.1 Potential Adverse Effects

The elements of the proposed project that were identified as posing a pressure on the special conservation interests of Cork Harbour SPA within the ZOI as stated above are identified as:

- Emissions to Air (Dust)
 - During repair and rehabilitation, dust will arise from demolition works, vegetation removal, verge excavation and loading and unloading of construction materials, which may disperse to the environment.
- Emissions to Water
 - Sedimentation may result from vegetation clearance, tree removal and demolition.
 - Mortar, concrete and chemicals (from invasive species treatment) release into the aquatic environment
 - Hydrocarbons associated with machinery onsite may enter the watercourse due to spillages during refuelling.
- Invasive Species
 - The high impact invasive species Japanese knotweed is present on site. As part of the project, this species will be treated, but there is a risk that during and post treatment, machinery and personnel could act as a vector, spreading this species or introducing other invasive species to adjacent lands or watercourses.
- Cumulative Impacts with other Projects and Plans.

An assessment of the potential for the proposed work to adversely affect the integrity of the Cork Harbour SPA is presented hereunder (Table 4.3) with respect to the qualifying interests which have been identified to be within the likely zone of influence of the project.



Table 4-3: Conservation Objectives and Targets for Relevant Species of Conservation Interest with Potential for Adverse Effects on Site Integrity of Cork Harbour SPA

Species/Habitat	Conservation Objective	Attribute	Measure	Target	Potential For Adverse Effects on Site Integrity from proposed Project	Potential effect in-combination with other plans or projects	Duration of Effect in the absence of mitigation	Conclusion
Little grebe Great Crested Grebe Cormorant Grey heron Shelduck Wigeon Teal	To maintain the favourable conservation status of these bird species (Note: All Attribute, Targets and Measures are the same for these species)	Population Trend	Percentage change	Long term population trend stable or increasing	No as the SPA is not in the immediate vicinity of the proposed project and timing of the project will be short.	N/A	N/A	No potential for the project to affect this target either alone or in-combination with other plans or projects exists.
Pintail Red-breasted merganser Oystercatcher Lapwing Dunlin Black-tailed godwit Bar-tailed godwit Curlew Redshank		Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by these species, other than that occurring from natural patterns of variation	No as the SPA is not in the immediate vicinity of the proposed project, timing of the project will be short (1-2 months).	N/A	N/A	No potential for the project to affect this target either alone or in-combination with other plans or projects exists.



Species/Habitat	Conservation Objective	Attribute	Measure	Target	Potential For Adverse Effects on Site Integrity from proposed Project	Potential effect in-combination with other plans or projects	Duration of Effect in the absence of mitigation	Conclusion
Black-headed gull Common gull Lesser black-backed gull								
Common tern		Breeding population abundance: apparently occupied nests	Number	No significant decline	No as tern populations are spatially removed from the proposed project and not within the Glashaboy Estuary (Burke and Crowe, 2016).	N/A	N/A	No potential for the project to affect this target either alone or in-combination with other plans or projects exists.
		Productivity rate: fledged young per breeding pair	Mean number	No significant decline				
		Distribution: breeding colonies	Number; location; area (hectares)	No significant decline				
		Prey biomass available	Kilogrammes	No significant decline				
		Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase				



Species/Habitat	Conservation Objective	Attribute	Measure	Target	Potential For Adverse Effects on Site Integrity from proposed Project	Potential effect in-combination with other plans or projects	Duration of Effect in the absence of mitigation	Conclusion
		Disturbance at the breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the common tern population.				
Wetlands and Waterbirds	To maintain the favourable conservation condition of the wetland habitat in Cork Harbour SPA as a resource for the regularly-occurring migratory waterbirds that use it.	Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2,587 hectares, other than that occurring from natural patterns of variation	There is potential for adverse effects resulting from colonisation of invasive species resulting from the proposed works.	N/A	Long-term	Potential for the project to affect this target either alone or in-combination with other plans or projects exists



A potential for adverse effects due to the proposed works have been identified on Wetlands and Waterbirds of the Cork Harbour SPA.

4.5 Mitigation

4.5.1 Mitigation by Avoidance and Design

With regard to the construction phase of the proposed project, the following design and best practice measures are incorporated into the proposed plan for the bridge repair and rehabilitation

- In-stream works will only occur following examination of the eastern cutwater. If good stone is located, the cutwater will not need to be underpinned with a concrete base;
- In areas where water contact is more frequent, a more resistant NHL 5 mortar mix will be used, preventing washout;
- Concrete if required, will be pumped into place from the bridge deck;
- Tree trunks that are removed will be collected and disposed of offsite by means of recycling as wood chippings;
- Damming will only occur during periods of low flow.

Further mitigation measures prescribed to reduce and/or avoid the potential for the proposed project to have an adverse effect on the integrity of Cork Harbour SPA are prescribed hereunder.



Table 4-4: Details of Mitigation Measures to be Implemented for Proposed Project

No.	Mitigation Measure	How Measure Will Avoid/Reduce Adverse Effects	Implementation of Mitigation Measure and Level of Success	Monitoring scheme to prevent mitigation failure
<i>Mitigation Measures to be Implemented Prior to Construction</i>				
1	Invasive Species Treatment	<p>Prior to commencing works, Japanese knotweed species will be treated on site.</p> <p>The invasive species management plan in Appendix 2 for all works in areas is included.</p>	<p>Mitigation measures will be implemented in full by Cork City Council through the Contractor awarded the works.</p> <p>All required mitigation measures outlined below will be included as a contractual obligation on the contractor, in combination with competent supervisory staff overseeing the works.</p> <p>High probability of success.</p>	<p>An Ecologist or Invasive Species Specialist will monitor the implementation of the mitigation measures.</p>
2	<p>A Project Ecologist/ Ecological Clerk of Works (ECoW)</p> <p>The Ecologist/ECW will ensure successful implementation of all mitigation measures for biodiversity management.</p>	<p>A Project Ecologist/ Ecological Clerk of Works (ECoW) with appropriate experience and expertise (in bridge works) will be employed for the duration of the construction phase to ensure that all the mitigation measures outlined in relation to the environment are implemented.</p> <p>The Project Ecologist/ECoW will be awarded the authority to stop construction activity if there is potential for adverse ecological effects to occur.</p>	<p>A Project Ecologist/ Ecological Clerk of Works (ECoW) will be employed by the Cork City Council through the Contractor awarded the contract to construct the wind farm. All mitigation will be implemented in full.</p> <p>High probability of success.</p>	<p>The Project Manager will ensure an ECoW is assigned and the ECoW will monitor the implementation of mitigation measures.</p>



No.	Mitigation Measure	How Measure Will Avoid/Reduce Adverse Effects	Implementation of Mitigation Measure and Level of Success	Monitoring scheme to prevent mitigation failure
3	Communication with IFI	<p>A line of communication with Inland Fisheries Ireland will be established and fisheries officers will be invited to inspect mitigation measures at the site.</p> <p>This will ensure transparency, encourage proactive culture around implementation of measures and facilitate input from key stakeholders if required.</p>	<p>Mitigation measures will be implemented in full by Cork City Council through the Contractor awarded the repair and rehabilitate the bridge.</p> <p>High probability of success.</p>	<p>The ECoW will monitor the implementation of the mitigation measures.</p>
4	Toolbox Talks	<p>Toolbox talks will be undertaken with construction staff on disturbance to key species and invasive species prevention and contamination control, prior to and during construction.</p> <p>This will ensure all personnel present receive relevant information on the site prior to works.</p>	<p>Toolbox talks will be provided by an Ecologist before the start of works.</p>	<p>The ECoW will monitor the implementation of the mitigation measures.</p>
5	Invasive Species Management	<p>Where invasive species have been physically removed and soil disturbed, this soil will be seeded or replanted (including 5cm deep mulch) with native plant species. This will prevent erosion of the riverbank and the easy colonisation of bare soil by invasive species in the area.</p> <p>Soil imported to the site for infilling of embankments will receive documentation from suppliers stating that it is free from invasive species.</p>	<p>Mitigation measures will be implemented in full by Cork City Council through the Contractor awarded to treat invasive species onsite.</p> <p>High probability of success.</p>	<p>The ECoW will monitor the implementation of the mitigation measures.</p>
Construction Phase Mitigation Measures				
6	Protection of Habitats	<p>The area of the proposed works will be kept to the minimum necessary, including all site clearance works, to minimise disturbance to habitats and flora. In this case, the footprint of the proposed development has been kept to the minimum necessary.</p> <p>No disturbance to habitats or flora outside the proposed project area will occur.</p>	<p>Mitigation measures will be implemented in full by Cork City Council through the Contractor awarded the repair and rehabilitate the bridge.</p> <p>High probability of success.</p>	<p>The Project Manager will monitor the implementation of the mitigation measures.</p>



No.	Mitigation Measure	How Measure Will Avoid/Reduce Adverse Effects	Implementation of Mitigation Measure and Level of Success	Monitoring scheme to prevent mitigation failure
		<p>Machinery, and equipment will be stored within the site compound.</p> <p>Designated access points will be established within the site and all construction traffic will be restricted to these locations. In the event of in-stream works, designated access points to the river will be established for personnel.</p>		
7	Protection of Avifauna	<p>Construction operations will take place during the hours of daylight to minimise disturbances to roosting birds or any active crepuscular/nocturnal bird species.</p> <p>The construction compound will not be lit at night.</p> <p>The construction area will not be lit at night.</p> <p>Removal of mature vegetation will be carried out outside of the bird breeding season (March 1st – August 31st). Where this is not possible due to construction program constraints the appointed ECoW will inspect the area to be felled no more that 48hrs in advance of the felling / clearance works and advise if bird species are present and if so, on a suitable exclusion buffer needed until the species has fledged.</p>	<p>Mitigation measures will be implemented in full by Cork City Council through the Contractor awarded the repair and rehabilitate the bridge.</p> <p>High probability of success.</p>	<p>The ECoW will monitor the implementation of the mitigation measures.</p>
8	Plant and vehicle contamination prevention	<p>All site plant will be inspected at the beginning of each day prior to use. Defective plant shall not be used until the defect is satisfactorily fixed.</p> <p>All major repair and maintenance operations will take place off site.</p> <p>Vehicles entering the site will be in good working order, free from leakage of fuel or hydraulic fluid.</p>	<p>Mitigation measures will be implemented in full by Cork City Council through the Contractor awarded the repair and rehabilitate the bridge.</p> <p>High probability of success.</p>	<p>The Project Manager will monitor the implementation of the mitigation measures.</p>



No.	Mitigation Measure	How Measure Will Avoid/Reduce Adverse Effects	Implementation of Mitigation Measure and Level of Success	Monitoring scheme to prevent mitigation failure
9	Pollution Incident Control Response	<p>All personnel working on site will be trained in pollution incident control response.</p> <p>A regular review of weather forecasts of heavy rainfall (>10mm/hour) is required.</p> <p>All major repair and maintenance operations will take place off site.</p> <p>Vehicles entering the site will be in good working order, free from leakage of fuel or hydraulic fluid.</p> <p>Portaloos and / or containerised toilets and welfare units will be used to provide toilet facilities for site personnel.</p> <p>Sanitary waste will be removed from site via a licensed waste disposal contractor.</p>	<p>Mitigation measures will be implemented in full by Cork City Council through the Contractor awarded the repair and rehabilitate the bridge.</p> <p>High probability of success.</p>	<p>The Project Manager will monitor the implementation of the mitigation measures.</p>
10	Concrete	<p>Major construction works including concrete pours onsite will be timed to occur outside periods where heavy rainfall (>10mm/hour) would be expected.</p> <p>A regular review of weather forecasts (weather forecasts will be checked at least 24 hours in advance of works.) of heavy rainfall is required, and the site contingency plan will be updated in accordingly before and after such events.</p> <p>Concrete to be utilised will contain curing agents to ensure fast setting.</p> <p>The washing out of concrete lorries is not permitted at the site including the site compound.</p>	<p>Mitigation measures will be implemented in full by Cork City Council through the Contractor awarded the repair and rehabilitate the bridge.</p> <p>High probability of success.</p>	<p>The Project Manager will monitor the implementation of the mitigation measures</p>
11	Instream control practices	<p>Instream isolation will be necessary if the cutwater is in poor condition requiring underpinning. This will require sediment control in the flowing water and isolating sediment from the work area from the watercourse.</p>	<p>Mitigation measures will be implemented in full by Cork City Council through the Contractor</p>	<p>The Project Manager will monitor the implementation of the mitigation measures</p>



No.	Mitigation Measure	How Measure Will Avoid/Reduce Adverse Effects	Implementation of Mitigation Measure and Level of Success	Monitoring scheme to prevent mitigation failure
		<p>A cofferdam will be installed during instream works. This will consist of a polypropylene bag, filled with clean pea gravel grade (sand or deleterious materials will not be permitted in the event of bag breakage). These bags will provide a structural barrier to the watercourse and provide a dry area for works.</p> <p>Dye testing will be implemented to ensure efficacy of the dam prior to concrete works. Small amounts of 'Fluorescein' an effective non-toxic dye is recommended to ensure visibility in the water column. Food dyes and other common dyes are not effective for testing due to the lack of visibility. Any leaks identified will be plugged to minimise concrete washout reaching the river. A second dammed area shall be constructed using smaller (e.g. 25kg) pea gravel filled sand bags. This secondary dammed area shall be placed immediately downstream and connected to the cofferdam. The ponded area of still water will capture concrete washout water to allow for it to be pumped out of the watercourse, minimising the volume of concrete washout entering the watercourse. Water will be pumped out of this area using a mobile bowser which will treated using best practice systems before discharging over land. Water that is pumped out will not be discharged into the river.</p> <p>Water will be continually pumped from behind the dam to ensure a dry area for works.</p> <p>The bags will be sealed, and a liner will be installed in the event of stacking being required due to water depths. Bags will not be filled to capacity to avoid breakage.</p>	<p>awarded the repair and rehabilitate the bridge.</p> <p>High probability of success.</p>	



No.	Mitigation Measure	How Measure Will Avoid/Reduce Adverse Effects	Implementation of Mitigation Measure and Level of Success	Monitoring scheme to prevent mitigation failure
<i>Operational Phase Mitigation Measures</i>				
12	Invasive Species Management Plan (Appendix 2).	Invasive species will continue to be treated within the project area according to the invasive species management plan for as long as they persist within the site.	Mitigation measures will be implemented in full by Cork City Council. High probability of success.	Cork City Council will monitor the implementation of Invasive Species Management Plan.



4.6 Residual Effects on the Integrity of the Sites within the Potential Zone of Influence of the Proposed Project

Taking cognisance of measures incorporated into the project design and mitigation measures to avoid effects which are considered in the preceding section, the proposed project will not adversely affect the integrity of Cork Harbour SPA.

4.7 Conclusion

For the reasons set out in detail in this NIS, in the light of the best scientific knowledge in the field, all aspects of the proposed project which, by itself, or in combination with other plans or projects, may affect the relevant European Sites have been considered.

The NIS contains information which the competent authority, may consider in making its own complete, precise and definitive findings and conclusions and upon which it is capable of determining that all reasonable scientific doubt has been removed as to the effects of the proposed project on the integrity of the relevant European sites.

In the light of the conclusions of the assessment which it shall conduct on the implications for the European sites concerned, the competent authority is enabled to ascertain that the proposed project will not adversely affect the integrity of any European site.



5. REFERENCES

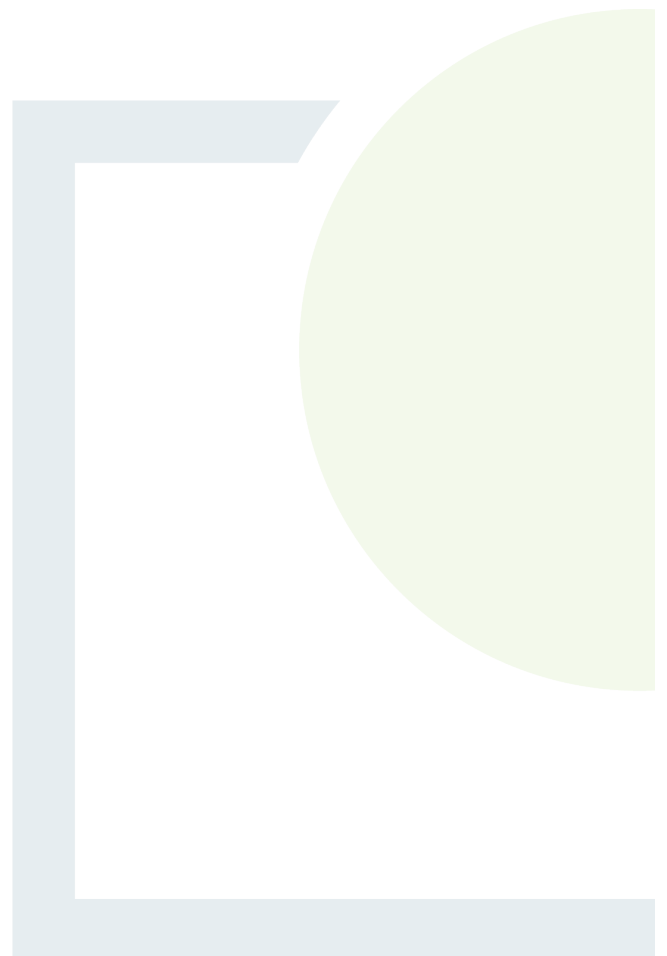
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APPENDIX 1

LIST OF PROJECTS
CONSIDERED THE IN-
COMBINATION ASSESSMENT



Granted applications within the past five years (2017-2022) with hydrological connectivity to the Butlerstown River.

Development Name/Type	Decision Year	Planning Reference Number	Description	Address	Distance from Project
Dunkettle Interchange Upgrade	2017	Unavailable	<p>A series of direct road links between the N8, the N25 and the N40 and links to the R623 Regional Road in Little Island and Burys Bridge in Dunkettle.</p> <ul style="list-style-type: none"> • 1 grade separated junction arrangement at the existing N25 to the east of the existing Dunkettle Interchange • 4 roundabouts – 2 at the grade separated junction and 2 at tie-ins with the existing road network • 52 structures of various forms • Several culverts where the scheme crosses watercourses or intertidal areas • Intelligent Transport Systems • Pedestrian and cyclist facilities. 	Dunkettle, Glanmire, Co. Cork	2.5km south
CMP Road Planning Offices	2021	206249	To construct a new two storey building for office accommodation, staff facilities, parking, entrance off existing estate road and all ancillary site works.	North Esk Business Park, Dunkettle, Glanmire, Co. Cork	2.5km south
Two storey house	2017	175434	Construction of a two storey dwelling house and all associated site works (change of house design and site layout from that granted under planning file no 14/5388)	Main Street, Poulacurry South, Glanmire, Co. Cork	1.3km south-west
Car park	2019	1938663	Permission for the following proposed development at the rear of existing Bank premises including Level car park, (a) incorporating 14 customer car park spaces (b) Removal of existing temporary road boundary hoarding and construction of new masonry 1.8m high boundary wall including new vehicular entrance.	Ballinglanna, Glanmire	0.9km south-west
Residential development	2021	2039719	Permission for (1) The demolition of existing dwelling house and garage, (2) The construction of 30 no. dwelling houses and all ancillary site development works	Glanmire Lodge, Dunkettle, Glanmire, Cork	1km south-southwest
Nursing Home	2020	1938980	Permission for the construction of a nursing home at the former Glanmire Rectory	The former Glanmire Rectory, Dunkettle, Glanmire, Co. Cork	1km south-southwest

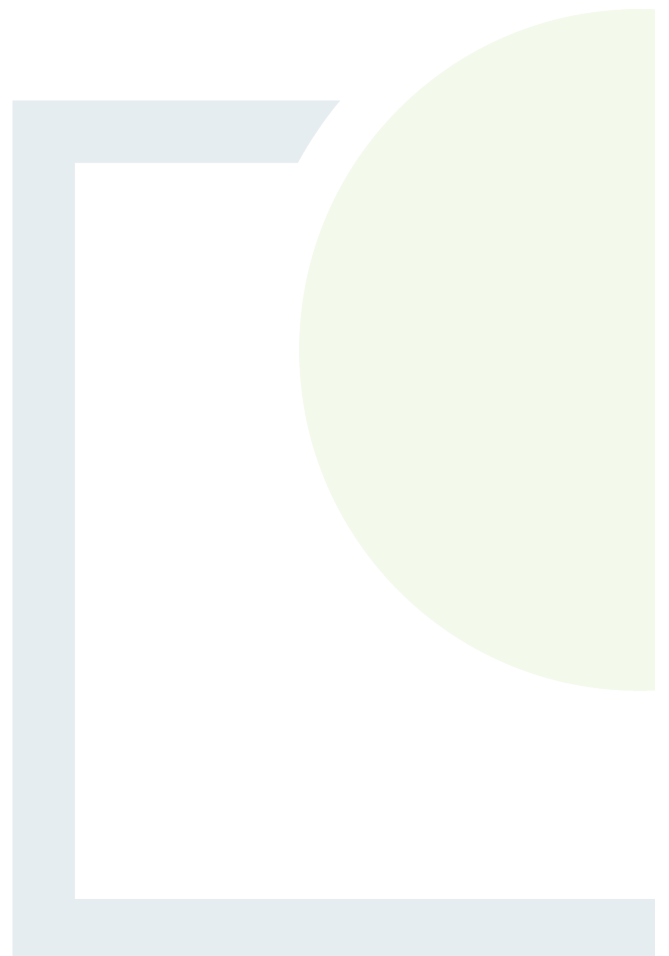
Development Name/Type	Decision Year	Planning Reference Number	Description	Address	Distance from Project
Changes and Amendments to apartment block	2020	2039179	Full planning permission for changes and amendments to 2 no duplex apartment blocks	Ballinglanna, Glanmire	0.8km south-west
Infrastructure Revisions	2017	175391	Revisions to site services infrastructure, with connections and outfalls to serve permitted serviced-sites development and associated ancillary siteworks.	Eastcliffe Road, Glyntown, Ballinglanna, Glanmire, Co. Cork	0.4km south-west
Sarsfields Hurling Wall	2019	194946	Construction of a hurling wall at the western end of existing Astro turf pitch at sports facility	Riverstown, Glanmire, Co. Cork	0.2km north-east
Single residential development	2020	2039512	Permission to construct a new single storey residential extension to the north elevation (front) of the existing dwelling consisting of a floor area of (5.7 sq. m) and all associated site works	5 Rivergrove, Riverstown, Glanmire, Cork	0.4km east
Drying room for Glanmire Community College	2018	177006	For the removal of an existing steel container and the construction in its place of a single storey prefabricated standalone drying room facility including connections to existing services and associated site works	Glanmire Community College, Brooklodge, Glanmire, Co Cork	0.52km north east
Retention of window	2018	177257	Retain an additional bedroom window on the first floor of the rear elevation of dwelling house, which is presently being constructed under planning permission 14/6410	New Line, Ballinglanna, Glanmire, Co. Cork	0.9km north-west
Change of use	2018	177258	Alterations, extension and partial change of use to form granny flat, consisting of a two storey rear and side extension, elevational changes and associated site works.	Rose Cottage, New Line, Ballinglanna, Brooklodge, Glanmire, Co. Cork	1km north west



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APPENDIX 2

INVASIVE SPECIES
MANAGEMENT PLAN





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PLANNING

ENGINEERING CONSULTANCY SERVICES FOR CORK CITY BRIDGES

INVASIVE SPECIES MANAGEMENT PLAN

Prepared for: Cork City Council



**Cork
City Council**
Comhairle Cathrach Chorcaí

Date: October 2022

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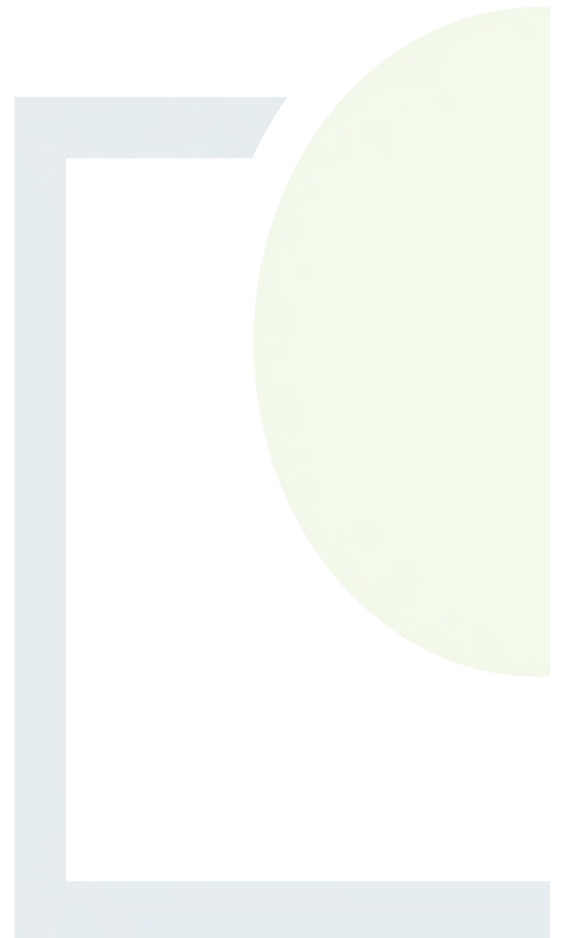


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1. INTRODUCTION

Cork City Council has commissioned Fehily Timoney & Company (FT) to prepare an Invasive Species Management Plan for the repair and rehabilitation works at the existing Glyntown Bridge, over the Butlerstown River, located 9km to the east of Cork City Centre. Fehily Timoney & Company (FT) has prepared this Invasive Species Management Plan (ISMP) to comply with Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 to 2021 (not to cause the spread of non-native invasive plant species listed in schedule III), and to ensure non-native invasive plant species not listed in schedule III are not spread to adjacent lands or Natura 2000 (European) sites. The report details a programme for the control, eradication and monitoring of invasive species in the area immediately surrounding Glyntown Bridge to account for the works footprint needed for the bridge rehabilitation.

A recent ecological walkover covering the habitat surrounding the bridge and stream was conducted on the 8th of November 2021. The following invasive plant species were identified: Japanese knotweed, cherry laurel, butterfly-bush and winter heliotrope.

In keeping with the third schedule of S.I. No. 477/2011 European Communities (Birds and Natural Habitats) Regulations 2011 to 2021, the overall aim of this management plan is to put in place systems to contain the spread of invasive species within the footprint needed to complete rehabilitation works of Glyntown Bridge, to control the invasive species from this area, and to ensure they are not spread off-site during the bridge repair and rehabilitation works.

This document provides background information on the non-native invasive species present, mapping of their location and their extent within the footprint of the remediation site. It provides sources of information including policy and guidelines to which cognisance has been paid, and the means of eradicating the species from site safely using prevention, containment, treatment, monitoring, follow up treatment, record keeping and appropriate disposal.

1.1 Legislative Context

In Ireland, the spread and propagation of species listed in the third schedule of S.I. No. 477/2011 European Communities (Birds and Natural Habitats) Regulations 2011 to 2021 is an offence. Under Regulation 49 (2) - Save in accordance with a licence granted under paragraph (7), any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in any place specified in relation to such plant in the third column of Part 1 of the Third Schedule, any plant which is included in Part 1 of the Third Schedule, shall be guilty of an offence. Under Regulation 50 it is an offence to transport a vector material listed in Part 3 of the Third Schedule except under licence; in the case of this project, it would apply to soil or spoil taken from places infested with Japanese Knotweed (*Fallopia japonica*).

In October 2017, Ireland's 3rd National Biodiversity Action Plan, for the period 2017-2021 was launched with 7 objectives supported by 119 targeted actions. The Plan sets out actions through which a range of government, civil and private sectors will undertake to achieve Ireland's 'Vision for Biodiversity' and follows on from the work of the first and second National Biodiversity Action Plans.

Target 4.4 states that '*Harmful invasive alien species are controlled and there is reduced risk of introduction and/or spread of new species.*'



This is supported by 7 actions, those relevant to this management plan are:

4.4.2. Develop national and whole island plans to implement the EU Invasive Alien Species (IAS) Regulation and relevant sections of Ireland's EU (Birds and Natural Habitats) Regulations 2011 including: development and adoption of biosecurity plans in relevant state bodies; a Rapid Response Protocol for the island of Ireland; coordination and collation of invasive species surveillance and monitoring data; and work with Northern Ireland and UK authorities on invasive species of mutual concern.

4.4.3. Continue and enhance measures for eradication, where feasible, control and containment of invasive species

4.4.4. Encourage horticultural nurseries to produce native species, varieties and landraces from appropriate native sources for public and private sector plantings. Public bodies will endeavour to plant native species in order to reduce importation of non-native species, varieties and landraces.

4.4.6. Publish legislation to address required provisions under the EU Regulation on invasive alien species (No. 1143/2014) and on responsibilities and powers regarding invasive alien species, giving IFI responsibility for aquatic invasive species.

In the case of this project, it would apply to soil or spoil taken from places infested with cherry laurel, butterfly-bush and winter heliotrope.

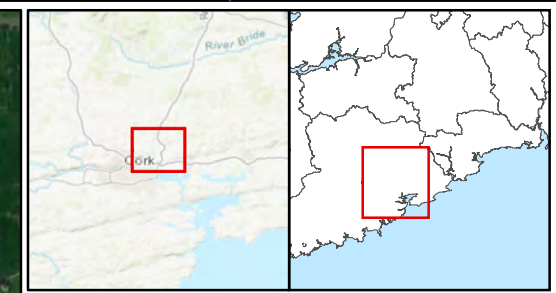
1.2 Site Description

Glyntown Bridge carries the L2998, East Cliff Road, over the Butlerstown River approximately 9km to the East of Cork City Centre. The year of construction is unknown, but the structure is a 3-span masonry arch bridge. Glyntown Bridge carries vehicular and pedestrian traffic in the busy Glanmire townland and is situated on the Butlerstown River approximately 50m east of the confluence of the Glashaboy River.

The site is located in an urban area, in the vicinity of commercial units, residential estates, sports fields and wooded parklands.

The riparian habitat on the northern bank is poor: the northern bank upstream of the bridge is walled, outside which is a laurel hedge. Donkeys have access to the northern bank between the bridge and the confluence of the two rivers, causing mild poaching of the ground. Downstream of the confluence, the habitat on the northern bank is primarily amenity grassland. The riparian habitat on the southern bank is much more natural, with a variety of species and growth forms.

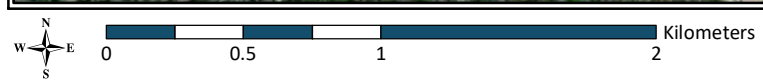
The habitat surrounding the bridge and stream is predominantly broadleaved woodland and hedgerows/treeline (Fossitt, 2000). Extending beyond these habitats, the surroundings included recolonising hardstanding areas, built land (roads and buildings) and amenity grassland.



Legend

 Site Location

TITLE:	Site Location		
PROJECT:	Engineering Consultancy Services for Bridges (Glyntown)		
FIGURE NO:	1-1		
CLIENT:	Cork City Council		
SCALE:	1:27500	REVISION:	0
DATE:	05/09/2022	PAGE SIZE:	A3





2. METHODOLOGY

2.1 Relevant Guidance

The methodology and guidance for this management plan has been devised in consideration of the following relevant guidance:

- NRA, (2010). Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads. Revision 1, December 2010. National Roads Authority.
- Property Care Association (2018). Practical Management of Invasive Non-Native Weeds in Britain and Ireland. Packard Publishing Ltd.
- Kelly, J., Maguire, C.M. and Cosgrove, P.J., Muir, R.A. (2015). Best Practice Management Guidelines Japanese Knotweed *Fallopia japonica*. Prepared for NIEA and NPWS as part of Invasive Species Ireland.
- Tu, M., (2009). Assessing and Managing Species within Protected Areas. Protected Area Quick Guide Series. Editor J., Ervin, Arlington, VA. The Nature Conservancy, 40 pp.
- Stokes et al., (2004). Invasive Species in Ireland. Unpublished report to Environment and Heritage Service and National Parks and Wildlife Service. Quercus, Queens University Belfast, Belfast.

2.2 Desktop Study

A desktop study was carried out to identify existing records of Invasive flora species both within and adjacent to Glyntown Bridge, habitat suitability of the adjacent area for the invasive species and nearby the Butlerstown River. This study allows the surveyor to narrow down the source of the species introduction and its likelihood of spreading. The following sources of information were used:

- Invasive Alien Species in Ireland. <https://invasives.ie/> accessed Aug 2022;
- Invasive Species Ireland website <http://invasivespeciesireland.com/> accessed Aug 2022;
- OSI Aerial photography and 1:50000 mapping;
- National Parks and Wildlife Service (NPWS) web mapping;
- National Biodiversity Data Centre (NBDC) web mapping, 2km grid square (W77H) accessed Aug 2022; and
- Environmental Protection Agency (EPA) web mapping.

2.3 Mapping

The habitats surrounding the bridge and stream were identified and classified, according to 'A Guide to Habitats in Ireland' (Fossitt, 2000) during a walkover survey undertaken by Fehily Timoney and Sweeney Consultancy on the 8th of November 2021. During this survey, invasive species were identified and mapped.



3. EXISTING ENVIRONMENT

3.1 Desktop Records

Historical records of invasive species from the relevant national datasets were assessed through the National Biodiversity Data Centre (30/08/2022). A total of five invasive species were identified within the 2km grid square (W77H) in which Glyntown Bridge is located (listed in Table 3-1 below):

Table 3-1: Invasive flora species previously recorded within the 2km grid squares of Glyntown Bridge

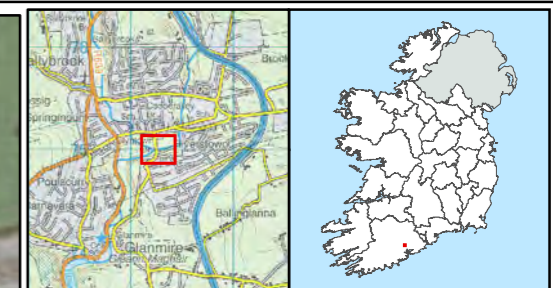
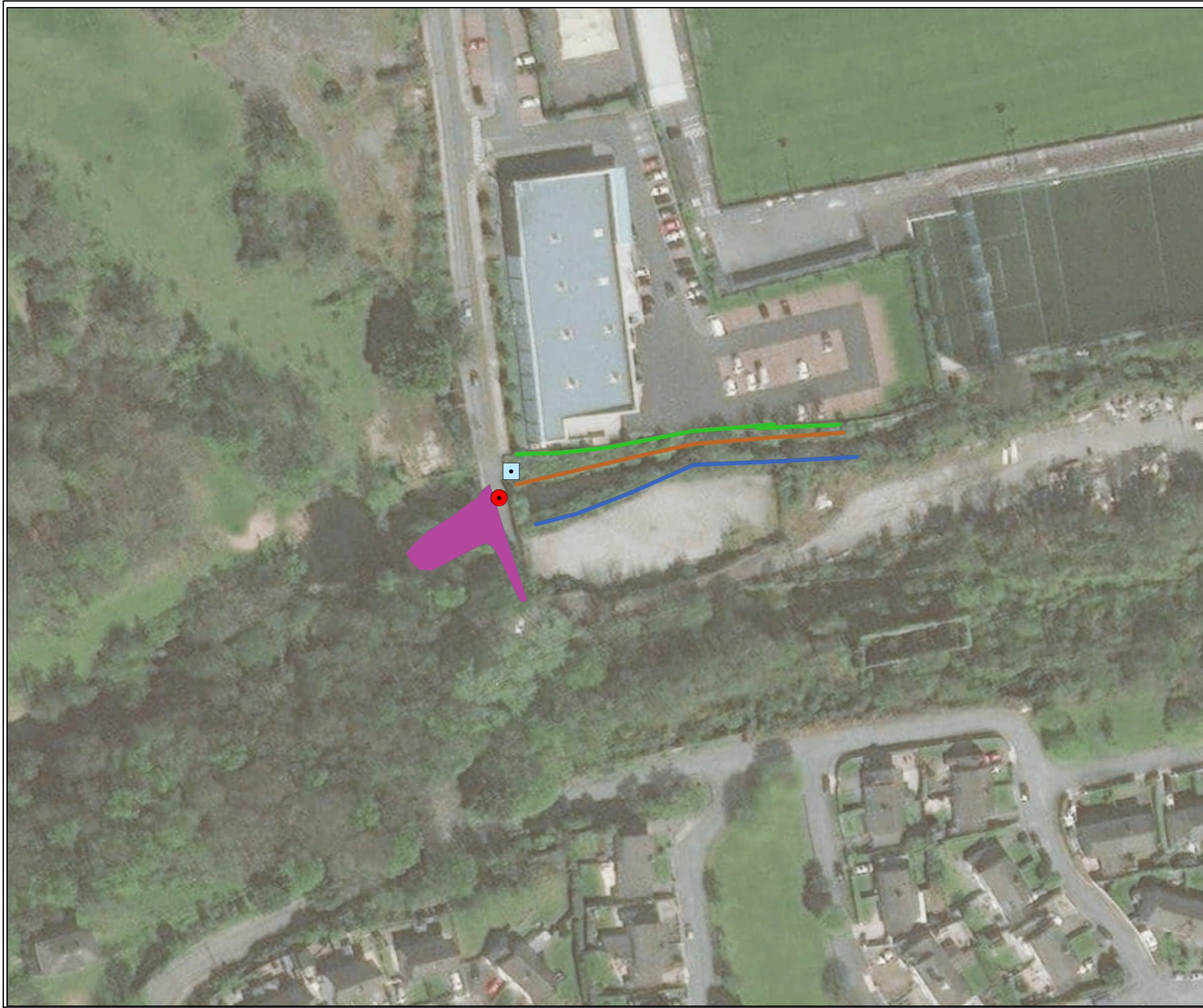
Common name	Latin name	Year of last record	Risk ¹
Giant Hogweed	<i>Heracleum mantegazzianum</i>	30/05/2018	High; third schedule listed species under Regulations 49 & 50 in the European Communities (Birds and Natural Habitats) Regulations 2011 to 2021.
Giant Rhubarb	<i>Gunnera tinctora</i>	13/06/2020	Medium; third schedule listed species under Regulations 49 & 50 in the European Communities (Birds and Natural Habitats) Regulations 2011 to 2021.
Bohemian Knotweed	<i>F. x bohemica</i>	27/08/2014	High; third schedule listed species under Regulations 49 & 50 in the European Communities (Birds and Natural Habitats) Regulations 2011 to 2021.
Japanese Knotweed	<i>Fallopia japonica</i>	15/05/2018	High; third schedule listed species under Regulations 49 & 50 in the European Communities (Birds and Natural Habitats) Regulations 2011 to 2021.
Sycamore	<i>Acer pseudoplatanus</i>	28/08/2008	Medium; medium impact invasive species

3.2 Results of Field Survey







The following invasive species were recorded during a field survey undertaken by Fehily Timoney and Sweeney Consultancy on the 8th November 2021. They were detected in and adjacent to the footprint of the works (see Figure 3-1):

- Butterfly bush (*Buddleja davidii*);
- Cherry laurel (*Prunus laurocerasus*);
- Japanese Knotweed (*Fallopia japonica*);
- Winter Heliotrope (*Petasites fragrans*).

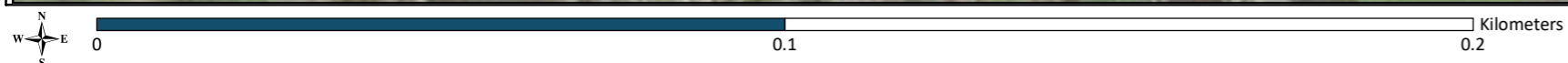
Kelly, J., O'Flynn, C., and Maguire, C. 2013. Risk analysis and prioritisation for invasive and non-native species in Ireland and Northern Ireland. A report prepared for the Northern Ireland Environment Agency and National Parks and Wildlife Service as part of Invasive Species Ireland.



Legend

-  Site Location
-  Japanese Knotweed
-  Butterfly Bush
-  Cherry Laurel
-  Winter Heliotrope/Butterfly Bush
-  Winter Heliotrope

TITLE:	
Invasive Species	
PROJECT:	
Engineering Consultancy Services for Bridges (Glyntown)	
FIGURE NO:	
3.1	
CLIENT:	
Cork City Council	
SCALE:	REVISION:
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4. INVASIVE SPECIES ACCOUNTS

The International Union for Conservation of Nature (IUCN) in their 'IUCN Guidelines for the Prevention of Biodiversity Loss Caused by Alien Invasive Species' 2000 paper describes non-native invasive species (referred to as an invasive species) as:

“an alien species which becomes established in natural or semi-natural ecosystems or habitat, is an agent of change, and threatens native biological diversity”.

The four invasive species listed below were recorded within the proposed works area for the bridge upgrade. Accounts of these species, summaries of their ecology, growth and management periods, and distribution are included below. The species in bold are included in the Third Schedule, the remaining are identified in Kelly, J., O'Flynn, C., and Maguire, C. 2013. *Risk analysis and prioritisation for invasive and non-native species in Ireland and Northern Ireland*. A report prepared for the Northern Ireland Environment Agency and National Parks and Wildlife Service as part of Invasive Species Ireland.

- Butterfly-bush (*Buddleija davidii*);
- Cherry Laurel (*Prunus laurocerus*);
- **Japanese Knotweed (*Fallopia japonica*)**;
- Winter Heliotrope (*Petasites fragrans*).

4.1 Butterfly Bush (*Buddleia davidii*)

4.1.1 Species Ecology

The Butterfly-bush is a multi-stemmed shrub which can reach 4m in height. From June to September, the arching branches bear conical panicles of lilac flowers, which may occasionally be white, pink, red or purple. Leaves are long and serrated along the edges. In the winter, flower heads and seed capsules remain despite the plant being deciduous. Up to 3 million seeds are produced per plant and can remain dormant in the soil for many years.

Butterfly-bush is common throughout Ireland. It spreads through abundant seed dispersal by wind and draught behind vehicles. While being a valuable source of nectar, especially for butterflies, *Buddleia* can cause structural damage to buildings by rooting in cracks in masonry.



Source: [https://wordpress.org/openverse/image "Buddleja 174"](https://wordpress.org/openverse/image/Buddleja+174) by lilli2de (accessed August 2022)

Plate 4-1: Butterfly Bush (*Buddleia davidii*).

4.1.2 Timeframe

Optimal time for treatment and/or movement of material would be outside of flowering and seed-bearing periods.

4.2 Cherry Laurel (*Prunus laurocerus*)

As Cherry Laurel is present outside of the footprint of the works area, treatment is not necessary. It is recommended that the area containing Cherry Laurel is cordoned off, observing a 1m buffer, to prevent disturbance and spread.

4.2.1 Species Ecology

Cherry Laurel is an evergreen shrub that forms dense thickets of either a single stem or multiple stems (especially if it has been trimmed). It has thick 5-15cm long oblong-ovate leaves; glossy green on surface and pale underneath. Leaves are arranged alternately on short leaf stalks and leaf edges are toothed with pointed tips. Small white fragrant flowers are held in clusters (racemes) and flowers are comprised of five petals and many yellow stamens. The clustered fruits are purple/black and cherry like.



Source: <https://wordpress.org/openverse/image/> "Cherry Laurel" by edenpictures (accessed August 2022)

Plate 4-2: Cherry Laurel.

4.2.2 Timeframe

Cherry Laurel can be cut down at any time of year; the herbicide glyphosate can also be applied throughout the year, however May to October inclusive is a sub-optimal period. Of principle concern when cutting and/or moving vegetation or surrounding soil is the movement of viable seeds. As such the optimal time for cutting is outside the flowering and fruiting period.

4.3 Japanese Knotweed (*Fallopia japonica*)

According to the Invasive Species Ireland Project who have carried out a risk assessment of Japanese Knotweed (*Fallopia japonica*), which is distributed throughout the island of Ireland, the species is “one of the highest risk (most unwanted) non-native invasive species in Ireland”. The species poses a risk to open and riparian areas where it spreads rapidly to form dense stands, excluding native vegetation and prohibiting regeneration. This process has been known to reduce diversity and alter semi-natural and locally important habitats for wildlife. Once stands become established, they are extremely persistent and difficult to remove. Japanese Knotweed can grow through weaknesses in both tarmac and concrete. Population clusters must be completely removed, under appropriate licencing, before site works or specific projects within the site can commence (ISI, 2018).

4.3.1 Species Ecology

Although Japanese Knotweed plants flower, all flowers in Ireland and Britain are female, precluding the possibility of sexual reproduction. The means of spread is entirely through the movement of rhizomes or rhizome fragments in soil or cut stems. Japanese Knotweed has an extraordinary ability to spread vegetatively from crown, stem and rhizome (underground root) if disturbed. Even tiny amounts of cut stem, crown or rhizome can produce a new plant.

Controlling the spread of the species is therefore dependent on preventing the spread of the stem, crown or rhizome. Japanese Knotweed causes numerous impacts, both ecological and economic.



It is capable of outcompeting native plants and blocking commuting corridors of native mammals, and damaging buildings, tarmacadam and concrete. In waterways, it can block and reduce water flow, increasing the risk of flooding. In winter, when it dies back, it can leave riverbanks bare and open to erosion.

Red/purple shoots appear early in spring, which in some cases have an asparagus-like appearance but, as the canes grow, the leaves unfurl, and the plant takes its more characteristic appearance. The mature canes are like bamboo, being hollow, and have a characteristic pattern of purple speckles.

The leaves are shield-shaped with pointed tips and a flat base, arranged in a zig-zag formation. The plant can grow to over 3m in height. Flowering occurs in late summer/autumn (End July – typically August) and consists of small creamy white flowers. During the winter the leaves die back and reveal orange/brown woody erect stems. Rhizomes are bright orange inside and can extend to a depth of 3m and a width of 7m around the visible growth above ground.



Source: "Expansion of Japanese Knotweed" by U. S. Fish and Wildlife Service (accessed: August 2022)

Plate 4-3: Characteristics of Japanese Knotweed.

4.3.2 Timeframe

Japanese Knotweed shoots typically appear between March and April. During this time energy stores from the root system are used to facilitate initial growth. The summer growth period commences in May and lasts until July, typical growth occurs during this time. Flowering begins in August and lasts until October. During this time the pale flowers can be seen.

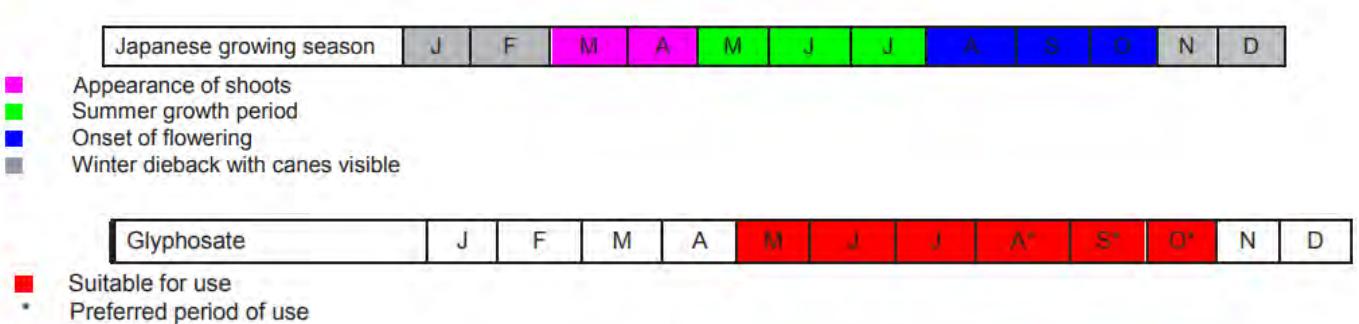


Figure 4-1: Japanese Knotweed Growth season summary (Kelly, et al., 2015).



Figure 4-1 indicates the suitable period which glyphosate herbicide is used to remove Japanese Knotweed. It is suitable to use glyphosate herbicide on Knotweed between the months of May and October, with August, September and October being the preferred months of use.

4.4 Winter Heliotrope (*Petasites fragrans*)

Winter Heliotrope (*Petasites fragrans*) is an invasive plant species, native to North Africa and the Mediterranean. It often forms dense carpets of kidney-shaped leaves, 20-50cm wide, and is not often confused with other species. Heliotrope prefers damp areas and embankments, both within waste ground areas and cultivated land. It can often be found along roadways and drains.

These deciduous plants produce large roundish leaves up to 30cm in diameter. These are downy underneath. Its pale pink flowers have a distinctive sweet smell and flower in December and January. Foliage forms a dense carpet with a height of approximately 30cm. Its rhizomatous root system allows vegetative spreading. Plate 4-4 displays some characteristic features of Winter Heliotrope. The Winter Heliotrope plants in Ireland are all clone males, originating from a single male, through fragmentation. These male plants are unable to produce seed and thus rely on root systems and fragmentation to spread. The species is thought to be widespread, but under recorded, in Ireland. Thought to have been introduced in the 1800s, first reported in pre-1866 records, it's believed that the species was originally either planted as winter ground cover or as a foodplant for bees (Reynolds, 2002).



Source: <https://wordpress.org/openverse/image/> "Petasites fragrans (Winter Heliotrope)" by Hugh Knott (accessed August 2022).

Plate 4-4: Characteristic features of Winter Heliotrope

4.4.1 Timeframe

It can be dug up any time of the year when soil is suitably dry. Spraying with chemicals should be done in February-March or July-September.

4.5 Recommended Measures



While it is extremely important and more efficient to contain invasive species at the point of infestation, care shall also be taken to ensure the management plan shall also be adhered to ensure that the species is not spread outside the works area.

Invasive Species Ireland (ISI) notes that invasive non-native species are the second greatest threat (after habitat destruction) to worldwide biodiversity. Invasive species negatively impact Ireland's native species; changing habitats and ultimately threatening ecosystems which impacts on biodiversity as well as economics as they are costly to eradicate.

Halting the spread of non-native invasive species can be achieved via prevention, containment, treatment, and eradication (ISI, 2012b).

4.5.1 General Prevention of spread within the works footprint

Prevention of the spread of invasive species will be achieved by:

- The full implementation of the invasive species management plan (section 5) in conjunction with a competent and experienced Invasive Species Specialist Contractor.
- Supervision of control measures and treatment works by an appropriately qualified ecologist or invasive species specialist.
- Raising awareness of site workers via toolbox talks given by a suitably qualified person as part of site introduction; informing workers what to look out for and what procedure to follow if they observe an invasive species.
- Where invasive species have been physically removed and disturbed soil, this soil will be seeded or replanted (including 5cm deep mulch) with native plant species. This will prevent erosion of the riverbank and the easy colonisation of bare soil by invasive species in the area.
- Contaminated material originating from the site will be transported off site by an appropriately licensed waste contractor and disposed of properly at a suitably licenced facility.
- Signs should warn people working there that there is invasive species contamination.
- Ensure good personnel and equipment hygiene practices:
 - Remove the build-up of soil on equipment;
 - Keep equipment clean;
 - Do not move fouled equipment from one site to another.
- All vehicles exiting the site should be washed down with a pressure washer to prevent the transport of seeds, since this cannot be prevented comprehensively by any other measure.
- Wastewater from washing facilities will be stored securely and treated to prevent spread outside the site.
- Footwear and clothing of operatives working near invasive species should be checked for seeds, fruits, or other viable material before exiting the site.

4.5.2 General Containment



Containment of invasive species will be achieved by:

- Japanese Knotweed and contaminated soil within the works area including the 7m buffer (where appropriate) from the footprint of the development will be excavated by a licensed specialist for the eradication of Japanese Knotweed. Cordoning off of the 7m buffer around Japanese Knotweed will occur if required. Japanese Knotweed's root structure rhizomes can extend up to 7 m in a lateral direction (but usually only up to 5 m), and 3m deep from the over ground parent plant.
- Cordoning off the area for other invasive species (Butterfly Bush, Cherry Laurel, Winter Heliotrope) shall include a buffer of up to 1m surrounding the area of infestation. This will prevent plants with underground rhizomes being transported to other sections of the riverbank and it will also prevent contact with plants which could result in the transport of seed, fruit or vegetation to other areas. No site works will occur within exclusion zones prior to the eradication of invasive species.
- No machinery or personnel shall be allowed within exclusion zones. Similarly, there shall be no storage of materials within or adjacent to exclusion zones.
- No soil or vegetation shall be removed from this area unless proper hygiene is observed and is transported via an appropriately licensed waste contractor to a suitably licenced facility for treatment.
- Informing all site staff through toolbox talks as part of site inductions.
- Any new sightings of invasive plant species shall be relayed to any workers entering site and the contractor for invasive species eradication. These areas shall follow the same protocol as the current infected area.

4.5.3 Treatment and control options - Butterfly-bush (*Buddleia davidii*)

Since the primary mode of spread for this species is via the transport of seeds in wind, the potential for spread due to human activities is considered relatively less important than for the other invasive species present; Butterfly Bush would continue to disperse and spread on its own in the absence of human intervention, while for the other species present, transport by humans is a more important mechanism of spread.

Control measures should focus on preventing the transport of seed outside the area during works, and minimising disturbance of ripe seed-heads if clearance works are required to be carried out while ripe seed is present.

Due to the widespread presence of butterfly bush along the riverbank to the east of the stream crossing, exclusion zones surrounding plants are unlikely to be practical. As such, measures to prevent the accidental transport of seed outside the site should be focused on washing down of machinery exiting the works area and checking of clothing and footwear of operatives.

Option 1: Physical control

Since it is likely that vegetation clearance will be required prior to works, measures should be taken to minimise the potential for disturbance of seed.

These measures should focus on the removal of flower spikes from all plants present within the works area.

If treatment can be undertaken while plants are in flower, all flower-spikes should be removed by a licensed invasive species contractor and removed off site to a licensed facility or buried in the area.



If treatment must be undertaken after flowers have been fertilised, each flower spike should first have a bag placed over them before cutting to prevent seeds being dislodged and spread during the process. The bags containing seed-heads should then be removed off-site to a licensed facility. This should be undertaken by a licenced invasive species contractor.

Following removal of reproductive material, plants should be cut to the stump, and cut material either retained on-site and buried during re-grading works or transported off site to a licensed facility and monitored until the following growing season to ensure no re-growth occurs prior to disposal.

4.5.1 Treatment and control options - Japanese Knotweed (*Fallopia japonica*)

Due to the size of the stand of the Japanese Knotweed (c. 1m²) and the proximity to the bridge, it is recommended that removal of the stand be undertaken instead of in-situ treatment. Care, however, must be taken so as not to allow the contaminated soil being removed to enter the watercourse.

The following site hygiene measures will be implemented during the proposed works:

- Fence off the infested areas prior to and during works where possible in order to avoid spreading seeds or plant fragments around or off-site.
- Site works will only be allowed within exclusion zones following the removal of Japanese Knotweed and contaminated soil.
- Clearly identify and mark out infested areas. Erect signs to inform Contractors of the risk.
- All staff shall be made aware of nature of threat via toolbox talks as part of site inductions.
- Avoid if possible, using machinery with tracks in infested areas.
- All machinery vehicles, equipment, footwear and clothing operating within area of infestation to be thoroughly checked and cleaned in appropriately contained area prior to leaving the area to protect against further spreading of Japanese Knotweed.
- Excavated soil to be removed to licensed facility on the day of extraction. No stockpiling of contaminated soil on-site.
- Soil imported to the site for infilling of embankments, contractor will gain documentation from suppliers stating that it is free from invasive species.
- Ensure all site users are aware of measures to be taken and alert them to the presence of the Invasive Species Management Plan.
- Erection of adequate site hygiene signage in relation to the management of non-native invasive material as appropriate.
- If operating within an area of known infestation all machinery, vehicles, equipment, footwear and clothing will be cleaned thoroughly (if necessary, using steam cleaners) in a contained area to avoid further contamination.



Option 1: Moving Soil and Treated Japanese Knotweed Off-site

Prior to excavation, herbicide treatment will take place and will be undertaken by a licensed invasive species contractor. Material (soil, vegetation, etc.) contaminated with Japanese Knotweed can only be transported offsite under the conditions of a relevant licence from the National Parks and Wildlife Service (NPWS). The material can only be removed to a prearranged EPA licenced waste transfer facility by the licenced haulier. Excavation for off-site disposal, great care needs to be taken to avoid excess waste and ensure the excavated Japanese Knotweed does not contaminate surplus soil that is currently free from infestation during excavations. When transporting soil infested with Japanese Knotweed, it is essential to carry out strict hygiene measures. If proper standards are not followed, this may lead to Japanese Knotweed spreading. Japanese Knotweed is a particular problem along transport corridors, where it interferes with the line of vision and can cause accidents.

Trucks which transport the material should only be filled up to a maximum of 20cm from the top. The void must be sealed with a well-secured membrane.

There must be enough membrane to seal the soil into a temporary cell for transporting. It is very important that the soil is contained to prevent any material being lost when it is moved. To contain the soil in the short-term, you can use a lower specification of membrane.

The final fate of Knotweed material transported off-site would be deep burial or incineration at an appropriately licensed facility.

4.5.1 Treatment and control options - Winter Heliotrope (*Fallopia japonica*)

Option 1: Physical Control

Excavation of Winter Heliotrope can be completed at any time of the year when soils are suitably dry. All plant material, particularly the rhizomes, should be excavated and processed appropriately. Regular follow-up treatment should be completed to combat re-sprouting of the species (NRA, 2010).

Contaminated plant matter, soils, and other materials should be appropriately disposed of using a licenced facility and transport.

Option 2: Chemical Control

A Glyphosate based chemical should be used after flowering in February to March, or in mid to late summer. Additional follow-up applications will be required. Foliar spraying, wiper applicator, or spot treatment of infestations should be completed within the appropriate time frames, after flowering (Typically February to March) (NRA, 2010).



5. MANAGEMENT PLAN

The management of any invasive species is achieved by the assessment and mapping of the invasive species, containment once found, continual monitoring and record keeping as well as the safe disposal of invasive species material. It is recommended that surveys be carried out periodically near the stream crossing to monitor the extent of invasive flora and the success of the eradication measures. These can be carried out by FT, or a contractor specialised in invasive flora eradication. Monitoring should continue at least two years after target invasive flora can no longer be detected to make sure successful eradication has been achieved. Liaison with land holders of adjacent sites may be necessary to effectively eradicate invasive species and prevent re-colonization. All invasive species which occur within the area utilized by people and machinery during the proposed bridge rehabilitation works must be eradicated within the works area before commencement of works.

5.1 Containment

For the efficient use of resources namely, financial, and physical effort, it is important to prevent the further spread of invasive species. Containment will be achieved via:

- Cordoning off the area of infestation to prevent further spread of seed or rhizome by people or machinery;
- Mark the cordoned off area with an information/warning sign;
- Toolbox talks to be carried out for all maintenance workers working near the stream crossing;
- Landholder to be informed of the location of the invasive species and the management plan;
- To help with monitoring of the infestation, the area is to be outlined where practical with spray paint;
- Ensure anyone treating the infestation is a suitably qualified trained professional who follows the management plan.
- The area around the stream crossing will be re-surveyed prior to treatment / remedial works to confirm the findings of the original survey.
- Follow up surveys will be carried out post-treatment to determine effectiveness of treatment and trigger further treatment if required.

5.2 Schedule

Please note that the schedule and treatment method may require amendment following any given site visit.



Table 5-1: Schedule of Eradication of invasive species

Year	Details of measures
1	<ul style="list-style-type: none"> • A pre-treatment survey (to reconfirm the findings of the ISMP) will be undertaken during the growing season to mark out the extent of invasive species within the proposed works area at the stream crossing prior to any works commencing there. • Cordoning off the area of infestation (exclusion zone) – this shall include a buffer of up to 7m surrounding the area of infection for Japanese Knotweed to ensure that underground rhizomes shall not be transported to other areas. No site works, storage, or access allowable within these exclusion zones until Japanese Knotweed has been fully eradicated. • Other invasive species observed shall include a buffer of up to 1m surrounding the area of infestation. This will prevent plants with underground rhizomes being transported to other areas and it will also prevent contact with plants which could result in the transport of seed, fruit or vegetation. • Toolbox talks shall be given to all personnel accessing the site, informing them of the locations of the invasive species and instructing them not to enter these areas (unless they are licensed invasive species contractors). • Control of invasive species using one or more of the treatment options proposed in Section 4.5 • Disposal of plant matter and soil off-site, should be completed through an appropriately licenced haulier and waste facility. Removal of a schedule 3 listed species such as Japanese Knotweed from the site will require a licence from NPWS. • Site to be monitored for signs of regrowth of all invasive species after the works have concluded.
2	<ul style="list-style-type: none"> • Following treatment, site to be monitored in the growing season following the works for signs of regrowth of invasive species, particularly Japanese Knotweed. • Monitoring of material collected during equipment washing for signs of growth during following growing season. • If any re-growth of Japanese Knotweed is observed a further Invasive Species Management Plan is to be prepared.

5.3 Mapping, Evaluating and Record Keeping

During each treatment the following will take place before control treatments:

1. Check that the area of infestation is still cordoned off and a warning/information sign is still in place;
2. Photographs of the area(s) of invasive species infestation;
3. Map the extent via recording GPS coordinates and measure the length and width of infestation and plot on map;
4. Evaluate the status/condition of the infestation;
5. If the infestation has spread spray paint the extent of the new area (for comparison on next visit);
6. Make sure step 1-5 are recorded.

At the end of each site visit the recorded data should be compared with the findings of this report and where required the management plan should be updated. Preparation of a short report on the progress of treatment following treatment works, and any subsequent monitoring.



6. CONCLUSION

There is a legal obligation not to spread plants listed on the third schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 to 2021; the relevant species at Glyntown Bridge, Co Cork, and therefore those of principal concern, is Japanese Knotweed (*Fallopia japonica*). Additionally, of concern for the invasive species management plan Winter Heliotrope and Butterfly Bush within the area adjacent to Glyntown Bridge, which will be disturbed during the proposed rehabilitation works on the bridge. Liaison with landholders of adjacent lands may be necessary to effectively control invasive species in the area and to prevent re-infestation.

Environmental best practice, and the need to prevent the spread of the other invasive species present on-site to Natura 2000 sites, dictates the need to take measures to prevent the spread of these species.

Various treatment and control measures are advocated for the invasive species present in the immediate area, with several options available in most cases.

It is recommended that a competent and experienced invasive species management Contractor is appointed to treat and control invasive species.

A dedicated invasive species survey is recommended to be undertaken by the appointed Contractor to confirm the findings of the previous survey.

All invasive species present will be required to be cordoned off prior to any treatment works, with exclusion zones in place as specified in section 5. Cherry Laurel is growing outside the footprint of the proposed works along the Lidl car park. The Cherry Laurel should be cordoned off towards the proposed works area.

A quarantine zone where equipment washing and inspection of clothing and footwear can be carried out should be established at the site entrance prior to treatment works and remain in operation until all vegetation has been removed or buried.

If works in infested areas are to take place then the growths of Japanese Knotweed present must be treated, excavated and disposed of or buried according to relevant legislation and under licence before any works can take place.

For the remainder of species, plant material, which is removed, should be taken off site to a licensed facility.

Treatment works should be supervised by an appropriately qualified ecologist or invasive species specialist.

Yearly monitoring for re-growth of invasive species is recommended in the growing season following works. If re-growth of invasive species, Japanese Knotweed in particular, is observed, a further invasive species management plan is to be prepared.



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