Proposed Bridge Rehabilitation Programme 2021
Kileengarrif Bridge,
Co. Limerick

Screening for Appropriate Assessment
&
Ecology Assessment

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SUMMARY

Limerick City & County Council (LCCC) propose to undertake rehabilitation works at several bridges in Co. Limerick in 2021 including at Kileengarrif Bridge. Each bridge is being subject to its own Screening for Appropriate Assessment and Ecological Assessment. The current document provides the Screening for Appropriate Assessment and the Ecology Assessment of the bridge rehabilitation works proposed for Kileengarrif Bridge. This report assesses whether the proposed works at this bridge are likely to have a significant effect on the Natura 2000 site network and if an NIS is required. In addition, the Ecology Assessment considers other local ecological interests that may be affected by the works at the bridge and if further surveys or mitigation is required for potential impacts on other local ecological features of interest. A letter from the Development Applications Unit of the Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media was received by Punches Consulting on the 15th of March 2021, provided in Appendix 2. The letter outlined recommendations / observations for Nature Conservation and are summarised in the current report, in addition to a summary of how these comments are addressed by Ecofact for the proposed works at Kileengarrif Bridge.

Kileengarrif Bridge is located over the 5th order Kileengarrif River in Murroe, Co. Limerick, which is a tributary of the River Mulkear. The bridge was visited by Ecofact ecologists in November 2020 and a walkover survey of the subject bridge site was carried out in addition to a desktop review of available information sources relating to the relevant Natura 2000 sites and ecological interests. The Kileengarrif River is designated within the Lower River Shannon SAC, a site selected for the presence of a large number of aquatic and terrestrial habitats, and aquatic / semi-aquatic species. Due to the location of the subject bridge the following qualifying interests of the Lower River Shannon SAC have the potential to be impacted by the proposed works: Lamprey species (Sea, River and Brook), Atlantic Salmon and Otter.

There is the potential for water quality impacts on the SAC to arise as a result of rehabilitation works at Kileengarrif Bridge, relating to increased suspended solids and accidental spillages of oils / fuels. There is also the potential for invasive species impacts, with Giant Hogweed noted to be present in the vicinity of the subject bridge; and Crayfish Plague known to be present in the River Mulkear downstream. In the absence of mitigation, invasive species could be spread further and to other parts of the SAC as a result of the proposed works. There is the potential for the qualifying interests: Otter, Brook / River lamprey and Salmon to occur in the Kileengarrif River at the subject bridge site which could be affected by disturbance impacts from the instream works proposed. Water quality protection, minimising disturbance and biosecurity measures will be required for the proposed bridge works.

From examination of the information available, it is concluded that there is the potential for direct, indirect and cumulative impacts arising from the proposed bridge works at Kileengarrif Bridge in Co. Limerick. Mitigation measures are required and cannot be provided in a Screening for Appropriate Assessment report. Therefore, a Natura Impact Statement is required for the proposed bridge works.

Regarding other ecological interests, the subject bridge site is considered to have potential for bats. There are crevices in the bridge structure that may be suitable for bats. An emergence watch survey is required and will be carried out in the active bat season to determine the importance of the structure for bats. The trees and vegetation at the subject bridge site also provide potential habitat for birds and birds' nests could be located within the bridge structure. Any vegetation removal will only take place outside of the bird nesting season. No evidence of mammal activity was observed during the current survey but it is recommended that a pre-construction mammal and Otter survey be carried out prior to the proposed works. Salmonid habitat was identified in the Kileengarrif River during the site survey. Water quality mitigation must be implemented throughout the proposed works at Kileengarrif Bridge to

protect the watercourse and any aquatic species present at the subject bridge site or downstream. In addition, strict biosecurity measures are required for the proposed works to prevent the spread of the invasive Giant Hogweed, which is present in the immediate vicinity of the subject bridge.

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1. INTRODUCTION

Limerick City & County Council (LCCC) propose to undertake rehabilitation works at several bridges in Co. Limerick in 2021. The locations of these bridges are shown in Figure 1. Ecofact has been commissioned to carry out assessments at a number of bridges included in the 2021 Bridge Rehabilitation Programme. Each of these bridges will be subject to its own Screening for Appropriate Assessment as well as a preliminary Ecological Assessment (Moanleana Bridge 1 and Bridge 2 will be assessed together). The Natura 2000 network is a network of nature protection areas across the European Union, comprising of Special Areas of Conservation which are designated under the EU Habitats Directive and Special Protection Areas which are designated under the EU Birds Directive.

The purpose of the Screening for Appropriate Assessment is to identify any such Natura 2000 sites in the locality of proposed plans / projects that are likely to be significantly impacted by the proposed plan / project and / or require mitigation to prevent such impacts. If the proposed plan is found by the Screening to be likely to significantly affect any Natura 2000 it will then be subject to a further stage of Appropriate Assessment whereby a Natura Impact Statement is prepared. In addition to the Screening for Appropriate Assessment the bridges will also undergo Preliminary Ecological Assessment. The purpose of the Preliminary Ecological Assessment is to consider other local ecological interests and potential constraints to the proposed works, but which may not be designated in Natura 2000 sites and therefore would not be assessed in the Screening for Appropriate Assessment.

Kileengarrif Bridge is one of the proposed bridges to be assessed. The current document provides a Screening for Appropriate Assessment Report of the rehabilitation works proposed for Kileengarrif Bridge, Murroe, Co. Limerick. This report assesses whether the proposed works at Kileengarrif Bridge are likely to have a significant effect on the Natura 2000 site network. Effects upon the conservation objectives and qualifying interests (including habitats and species) within the affected designated areas are considered.

Appropriate Assessment is required under Article 6 of the Habitats Directive (92/43/EEC), in instances where a plan or project may give rise to significant effects upon a Natura 2000 site. Natura 2000 sites are those identified as sites of European Community importance designated under the Habitats Directive (1992) or the Birds Directive (2009). The current document meets this requirement by providing a Screening Assessment of the development and follows the guidance for screening published by the Department of the Environment, Heritage and Local Government (DoEHLG 2010) *'Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities'.*

According to DoEHLG (2010), screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3) of the EU Habitats Directive:

> (1) Whether a plan or project is directly connected to or necessary for the management of the site, and;
> (2) Whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a Natura 2000 site in view of its conservation objectives.

Screening is a pre-assessment procedure which considers whether an assessment (i.e. appropriate assessment) is required or not. A project or plan may only pass at the Screening stage if there is no reasonable scientific doubt remaining as to the absence of impacts on the Natura 2000 network. The current screening therefore sets out to determine whether the proposed project, alone or in combination with other plans and projects, is likely to have significant effects on any Qualifying Interests of the Natura

2000 sites within the study area. If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA). When assessing the significance of potential effects, DoEHLG (2010) recommends that *"a precautionary approach is fundamental and, in cases of uncertainty, it should be assumed the effects could be significant".*

1.1 Legislative context

Part XAB of the 2000 Act and SI. No 477 of 2011 transpose into Irish law, Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the Birds Directive) and Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive). These Directives require Ireland to establish protected sites as part of a European wide network of sites (known in Ireland as European sites) for habitats and species that are of international importance for conservation. In Ireland, European sites include Special Areas of Conservation (SACs, including candidate SACs) and Special Protection Areas (SPAs)". Article 6, paragraphs 3 and 4 of the EC 'Habitats' Directive (1992) state that:

The 1997 Regulations were updated in 1998 by The European Communities (Natural Habitats) (Amendment) Regulations 1998 (S.I. No. 233/1998) to include Council Directive 97/62/EC which served to update Council Directive 92/43/EEC, adapting it to technical and scientific progress made in the intervening years.

The 1997 Regulations were again updated in 2005, by The European Communities (Natural Habitats) (Amendment) Regulations 2005 (S.I. No. 378/2005). This amendment served to consolidate the main nature conservation legislation enacted in Ireland, meaning The Wildlife Act 1976, The Wildlife (Amendment) Act 2000, The European Communities (Natural Habitats) Regulations 1997, The European Communities (Natural Habitats) (Amendment) Regulations 1998, and to draw direct reference upon Council Directive (2009/147/EC) on the conservation of wild birds – '*The Birds Directive'*.

The Birds Directive (2009/147/EC) seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs) whereas the Habitats Directive does the same for habitats and other species groups with Special Areas of Conservation (SACs). It lists certain rare habitats (Annex I) and species (Annex II) whose conservation is of community interest. It is the responsibility of each member state to designate SPAs and SACs, both of which will form part of Natura 2000, a network of protected areas throughout the European Community.

Article 6, paragraphs 3 and 4 of the Habitats Directive state that:

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

6(4) If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of

overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.'

In case C-323/17 People Over Wind and Peter Sweetman v Coillte, the Court of Justice of the European Union (CJEU) ruled that mitigation measures could not be taken into account when undertaking a screening for Appropriate Assessment (AA). If mitigation measures are required to reduce or avoid a significant adverse effect, then Appropriate Assessment is required.

1.2 Consultation

The following bodies provided information for this report, via publically available sources:

- National Parks and Wildlife Service (NPWS);
- National Biodiversity Data Centre (NBDC);
- Environmental Protection Agency (EPA).

A letter from the Development Applications Unit of the Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media was received by Punches Consulting on the 15th of March 2021. This letter is provided in Appendix 2 of the current report. The letter outlined heritage-related observations / recommendations for the 2021 Bridge Rehabilitation Programme in Co. Limerick. The recommendations / observations for Nature Conservation are summarised below, in addition to a summary of how these comments are addressed by Ecofact for the proposed works at Kileengarrif Bridge.

The Development Applications Unit highlighted the need for the issue of invasive alien plant and animal species, as well as Crayfish plague, to be assessed and detail methods required to ensure such species and diseases are not accidentally introduced or spread during construction. Invasive species have been highlighted as a potential impact affecting the Natura 2000 network in the current Screening for Appropriate Assessment. Giant Hogweed was also recorded on site. Mitigation for biosecurity is required and will be provided in a subsequent Natura Impact Statement.

The potential for bats roosting in bridges, as well as derogation licence requirements for bats and the impacts and guidelines are highlighted in the letter from the DAU. A daytime bat inspection was carried out on site as described in section 7.2.1. Based on habitat, it was decided that there was suitable bat roosting habitat at the bridge site and an emergence watch bat survey is required at the site. This survey is due to be carried out in the bat breeding season of 2021. A derogation license may or may not be required following the results of this survey.

Protected watercourse / wetland species are noted in the DAU letter, with specific reference to Otters, Salmon, lampreys, Freshwater Pearl Mussels, White-clawed Crayfish, Frogs, Newts, and Kingfishers. Furthermore, water quality, riparian habitat and consultations with IFI are specifically mentioned, as well as potential impacts on vascular, bryophyte and lichen species. Water quality impacts as well as disturbance impacts on some of the above mentioned species which are qualifying interests of the Lower River Shannon SAC. Potential pathways for these impacts have been identified in the current

Screening for Appropriate Assessment Report and the Other Ecological Interests Section 7. Mitigation is required and will be provided in a subsequent Natura Impact Statement.

Finally, the letter from the DAU regarding Nature conservation notes the potential requirements for licences where impacts on protected species and their habitats, resting or breeding places may occur. No works during the bird nesting season, as well as appropriate surveys and survey methodology are also noted in the letter, included in Appendix 2. Protected Species may be present at the site and potential pathways for impacts have been identified in the current Screening for Appropriate Assessment Report. Further assessment and mitigation measures are required and will be provided in a subsequent Natura Impact Statement.

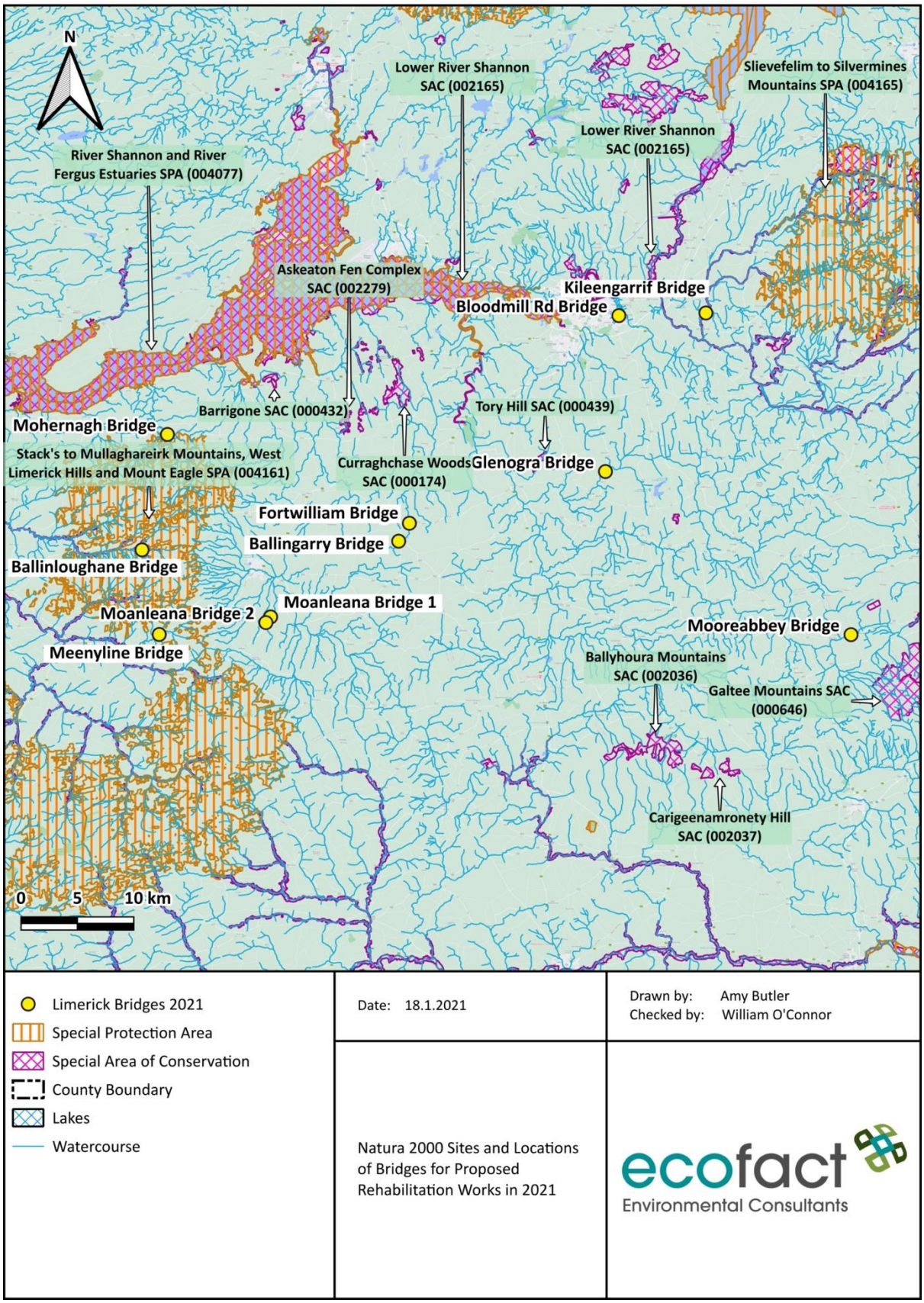

Figure 1 Natura 2000 Sites and Locations of Bridges for Proposed Rehabilitation Works in 2021.

2. METHODOLOGY

2.1 Desk study

A desktop study was undertaken to identify the extent and scope of the potentially affected designated Natura 2000 sites within the current study area in relation to the development site, including the Lower River Shannon SAC. The desktop study identified the qualifying interests (species and habitats) relevant to the designated sites within the area.

Information sources reviewed as part of the current assessment included NPWS site synopses, as well as protected species data held on the NPWS/NBDC online databases. Scientific data on water quality and waterbodies relevant to the subject site was obtained from the websites of the EPA and catchments.ie. The conservation objectives documents as well as the conservation objectives supporting documents for the Lower River Shannon SAC was also reviewed on the NPWS website. A full bibliography of information sources reviewed is given in the reference section. Online aerial imagery was accessed to characterise the nature of proposed works locations near the Natura 2000 network.

2.2 Assessment Methodology

The European Commission 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 prescribes a staged process, as set out below, the need for each stage being dependent on the outcomes of the preceding stage.

1. Screening for Appropriate Assessment
2. Appropriate Assessment
3. Assessment of Alternative Solutions
4. Assessment where no alternative solutions exist and adverse impacts remain, i.e. the Imperative Reasons of Overriding Public Interest test, and compensatory measures

The current report is a Screening Report and therefore makes Stage One assessment only.
According to DoEHLG (2010), screening can result in the following possible conclusions or outcomes:

> **AA is not required.** Screening establishes that the plan or project is directly connected with or necessary to the nature conservation management of the site.
>
> **No potential for significant effects/AA is not required.** Screening establishes that there is no potential for significant effects and the project or plan can proceed as proposed. However, no changes may be made after this as this will invalidate the findings of screening. Documentation of the AA screening process, including conclusions reached and how decisions were made, must be kept on file**.**
>
> **Significant effects are certain, likely or uncertain.** The plan or project **must either proceed to Stage 2 (AA), or be rejected**. Rejection of a plan or project that is too potentially damaging and/or inappropriate ends the process and negates any need to proceed to Stage 2 (AA).

The safeguards set out in Article 6(3) and (4) of the Habitats Directive are triggered not by certainty but by the possibility of significant effects. Thus, in line with the precautionary principle, it is unacceptable

to fail to undertake an appropriate assessment on the basis that it is not certain that there are significant effects.

The approach to screening is likely to differ somewhat for plans and projects, depending on scale and on the likely effects. It is stated in DoEHLG (2010) that any Natura 2000 site within or adjacent to the proposed development area as well as any Natura 2000 sites within the likely zone of impact should be included for assessment. A distance of 15km is currently recommended by DoEHLG (2010) to loosely define the zone of impact in the case of plans but the distance could be much less than 15km, and in some cases less than 100m: this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects. In the case of the current project any Natura 2000 sites in close proximity and / or those with downstream hydrological connectivity have been considered.

When doing a screening it is ***merely necessary to determine that there may be such an effect. '****The threshold at the first stage of Article 6(3) is a very low one. It operates merely as a trigger, in order to determine whether an appropriate assessment must be undertaken on the implications of the plan or project for the conservation objectives of the site.' (Finlay Geoghegan J. in Kelly -v- An Bord Pleanála 2013/802 JR).* A significant effect is defined as "*any effect that may reasonably be predicted as a consequence of a plan or project that may affect the conservation objectives of the features for which the site was designated, but excluding de minimis or inconsequential effects*" (EHS, 2002; English Nature, 2004 & 2006; Scottish Natural Heritage, 2006). Where the potential for a significant impact is identified, or if there is any uncertainty regarding an impact, then an Appropriate Assessment must be completed to assess if this effect would cause an integrity level impact. At Appropriate Assessment (NIS) stage mitigation can also be specified to reduce or avoid this effect. A screening assessment cannot replace the requirement of Appropriate Assessment so if any potential impact on qualifying interests or their habitats (e.g. siltation from works area during construction phase) is identified then Appropriate Assessment is required. Screening must be approached on a precautionary basis with the safeguards set out in Article 6(3) and (4) of the Habitats Directive triggered not by certainty - but by the possibility of significant effects.

3. DESCRIPTION OF PROJECT CHARACTERISTICS

Limerick City & County Council proposed to undertake rehabilitation works at several bridges as part of the Rehabilitation Programme for 2021. The proposed works at Kileengarrif Bridge are for the rehabilitation of an existing protected 5-arch stone masonry structure. There is no demolition or new build involved. Figure 2 shows the location of the proposed Kileengarrif Bridge rehabilitation works.

The required rehabilitation works for Kileengarrif Bridge are summarised as follows (Punch Consulting Engineers, 2021):

- All vegetation including trees, shrubs and the like will be removed for 10 m upstream and downstream of the bridge over a width of 10 m approximately on each bank. All efforts will be made to preserve mature and semi-mature trees, where possible and where they are not a threat to the structure of the bridge.
- Masonry units lying in the riverbed or on the riverbanks will be taken up and set aside for reuse. Other in stream works include erosion protection using concrete, replacement of missing stone, re-setting loose stone and re-pointing works. Local areas or individual arches will be bunded using sealed sandbags. In stream works will be carried out in between 1st July to 30th September.
- Replacement of missing stone, re-setting loose stone and re-pointing works will be carried out on the abutments, piers, arch barrels, spandrel walls, wing walls and parapets. Scaffolding will be erected in the riverbed to carry out these works.
- Parapet heights will remain unaltered.
- At road level, concrete rubbing strips will be provided at the base of both parapets to prevent the ingress of water into the structure below. Where necessary areas of road infill will be carried out using a surface course and binder (base), course of Dense Bitumen Macadam on a granular sub-base.
- Other ancillary items include; road side drainage; additional traffic signs; etc.

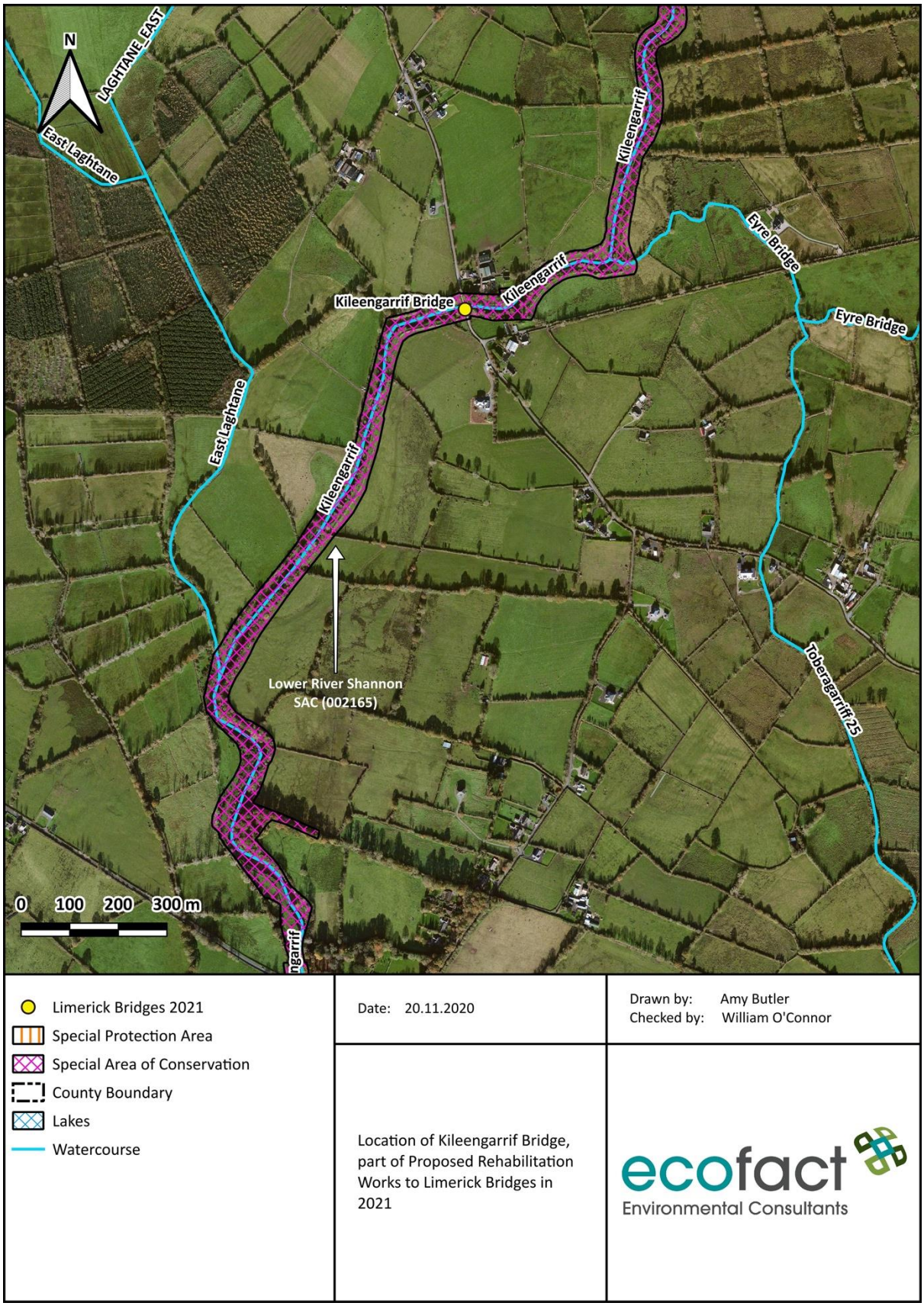

Figure 2 Location of Kileengarrif Bridge, part of Proposed Rehabilitation Works to Limerick bridges in 2021.

4. IDENTIFICATION OF RELEVANT NATURA 2000 SITES

4.1 Rationale for Appropriate Assessment Screening

Article 6 assessments are required under the Habitats Directive (92/43/EEC), in instances where a plan or project may give rise to significant effects upon a Natura 2000 site. Natura 2000 sites are those identified as sites of European Community importance designated under the Habitats Directive (Special Areas of Conservation, here after referred to as SACs) or the Birds Directive (Special Protection Areas, here after referred to as SPAs).

Following the guidelines set out by DoEHLG (2010) Screening for Appropriate Assessment is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3); i.e. whether a plan or project can be excluded from Appropriate Assessment requirements because it is directly connected with or necessary to the management of the site; and the potential effects of a project or plan, either alone or in combination with other projects or plans, on a Natura 2000 site in view of its conservation objectives, and considering whether these effects will be significant.

According to DoEHLG (2010), screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3) of the EU Habitats Directive:

> (1) Whether a plan or project is directly connected to or necessary for the management of the site, and;
> (2) Whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a Natura 2000 site in view of its conservation objectives.

The proposed works for Kileengarrif Bridge in Limerick does not comply with the first screening test (i.e. the proposed works are not directly connected to or necessary for the management of any Natura 2000 site). The current Screening Assessment therefore sets out to determine whether the development, alone or in combination with other plans and projects, is likely to have significant effects on the Natura 2000 sites within the study area.

4.2 Natura 2000 sites considered for the proposed works

The location of the proposed works at Kileengarrif Bridge in Co. Limerick in the context of the Natura 2000 network is indicated in Figure 2. Special Areas of Conservation (SAC's) are sites of international importance because of the presence of habitats or species that are of European importance, listed on the EU Habitats Directive (1992). Special Protection Areas (SPA's) for birds are designated based on the presence of internationally significant populations of bird species, listed in Annex I of the EU Birds Directive (2009).

Special Areas of Conservation (SAC) and Special Protection Areas (SPAs) considered in the current screening are listed in Table 1. Kileengarrif Bridge is located on the 5th order Kileengarrif River (Segment: 25_509) approximately 2km east of Annacotty Business Park. This bridge site is located within the Lower River Shannon SAC. This site will therefore be considered further in relation to potential impacts arising from the works.

In relation to the other Natura 2000 sites within 15km of the proposed works, the Slievefelim to Silvermines Mountains SPA is located c. 4.6km east, the Glenstal Wood SAC is located c. 5.3km east, the Clare Glen SAC is located c. 6.4km east, the River Shannon and River Fergus Estuaries SPA is

located c. 11.1km west and 21.7rkm downstream via the Kileengarrif River, and the Glenomra Wood SAC is located c. 12.9km north-west. There are no potential pathways for impacts on these sites.

4.2.1 Lower River Shannon SAC

The Kilengarrif Bridge is situated over the Kileengarrif River, a tributary of the River Mulkear which itself flows into the main River Shannon at Castletroy. Much of the Mulkear catchment, including the Kileengarrif River is designated within the Lower River Shannon Special Area of Conservation (SAC) (Site code: 002165). Kileengarrif Bridge is located within the Lower River Shannon SAC.

4.2.1.1 Qualifying Habitats

This designated site is selected for the presence of a large number of varied estuarine, aquatic and terrestrial habitats. The Lower River Shannon SAC is designated for the following Annex I Habitats listed as Q.I.s of the site: Sandbanks which are slightly covered by sea water all the time, Estuaries, Mudflats and sandflats not covered by sea water at low tide, Coastal lagoons, Large shallow Inlets and Bays, Reefs, Perennial Vegetation of Stony Banks, Vegetated Sea Cliffs of the Atlantic and Baltic coasts, Salicornia and other annuals colonising mud and sand, Atlantic salt meadows, Mediterranean Salt meadows, Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation, Molinia meadows on calcareous, peaty or clayey-silt-laden soilds and Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-padion, Alnion incanae, Salicion albae*).

The Lower River Shannon SAC has site-specific conservation objectives set out for each of the above mentioned Qualifying Habitats which include maps of their known extent within the SAC (NPWS, 2012a). Map 3 of the Conservation Objectives maps outlines the location of the ‘Sandbanks which are slightly covered by seawater all the time’ habitat, which was established using the Valentia Island to River Shannon Admiralty Chart (NPWS, 2012a). This map shows that this habitat is located c. 87rkm downstream of the subject bridge site, in the Shannon estuary (NPWS, 2012a).

Map 4 of the conservation objectives maps series for the Lower River Shannon SAC shows that the Annex I habitat ‘Estuaries’ extent includes the River Shannon channel as far as Limerick City (NPWS, 2012a). The inner extent of the 'Estuaries' habitat on the Shannon is c. 17rkm downstream of the subject bridge. Map 5 of the conservation objectives for the SAC shows that the tidal. ‘Mudflats and sandflats not covered by sea water at low tide’ habitat is also located further downstream, c. 21rkm from the subject bridge (NPWS, 2012a).

Map 6 of the conservation objectives maps series for the SAC shows the location of the ‘Coastal Lagoons’ habitat which is located in the Shannon Estuary (NPWS, 2012a). According to Map 6, this habitat is located c. 45rkm downstream of the proposed works (NPWS, 2012a). Map 7 outlines the location of the ‘Large Shallow Inlets and Bays’ habitat which is located over c. 87rkm downstream of the proposed works (NPWS, 2012a). The extent of the ‘Reefs’ habitat in the SAC is then mapped in Map 8 of the Conservation objectives, which shows that the nearest example of this habitat is located c. 53rkm downstream of the subject bridge site (NPWS, 2012a).

Map 10 of the conservation objectives maps series outlines that the extent of the ‘Perennial vegetation of stony banks’ habitat is located c. 68km west as the crow flies at its closest point, in Ballymacrinan Bay (NPWS, 2012a). Map 11 then illustrates both documented and undocumented locations of the ‘Vegetated Sea Cliffs of the Atlantic and Baltic Coasts’ habitat. This shows that the closest example of this habitat in relation to the proposed development site, is the undocumented record at Burrane, c.

62km west as the crow flies (NPWS, 2012a). Map 12 of the conservation objectives maps then shows the Saltmarsh Habitats in the SAC, showing documented and potential examples of the Atlantic Salt meadows, Salicornia and Mediterranean Salt Meadows habitats (NPWS, 2012a). This map shows that the closest Atlantic Salt Meadows habitat is c. 36rkm from the proposed works and the closest Mediterranean Salt Meadows habitat is c. 52rkm from the proposed works (NPWS, 2012a).

Map 13 of the Lower River Shannon SAC conservation objectives shows the extent of Floating River Vegetation in the SAC, outlining the vegetation types present. This shows that *Groenlandia densa* vegetation, which is part of the 'Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation' habitat, is located c. 15rkm downstream of the subject bridge site (NPWS, 2012a). Map 14 in the conservation objectives then outlines the known extent of the Woodland Habitats in the SAC, including Alluvial Forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)* and Old Sessile Oaks with *Ilex* and *Blechnum* in the British Isles, the latter of which is not listed as a Q.I of this SAC but is an Annex I habitat. This map shows that there is no mapped area of the designated Alluvial Forests habitat downstream of the subject bridge. The closest extent of the designated Alluvial forests habitat is located upstream of Kileengarrif Bridge on the Annagh River, a tributary of the Kileengarrif River, at the Clare Glens. It also occurs along the main River Shannon upstream of the Mulkear confluence (NPWS, 2012a).

4.2.1.2 Qualifying Species

This site is selected for the presence of aquatic and semi-aquatic species. The Qualifying Interests of the Lower River Shannon SAC listed on Annex II of the habitats directive are as follows: Freshwater Pearl Mussel, Sea lamprey, Brook lamprey, River lamprey, Salmon, Common Bottlenose Dolphin and Otter.

Map 15 of the conservation objectives series maps for the SAC shows the extent of Freshwater Pearl Mussel (FPM) distribution, catchments and suitable habitat (NPWS, 2012a). This shows that the Freshwater Pearl Mussel population of the SAC is confined to the River Cloon (NPWS, 2012a). There is therefore no downstream hydrological connection between the proposed bridge works site and the FPM population in this SAC.

Map 16 of the conservation objectives illustrates the Common Bottlenose Dolphin habitat in the SAC, including the main critical habitat (NPWS, 2012a). This shows that the extent of the Common Bottlenose Dolphin habitat is located c. 36rkm downstream of the proposed development site, with critical habitat located c. 55rkm downstream. Map 17 shows the commuting buffer for Otter in the SAC, noted as a 250m commuting buffer (NPWS, 2012a). This buffer is shown to include the River Shannon channel as far as Limerick City, c. 17.5rkm downstream of the subject bridge. Otter distribution in the Shannon catchment is estimated at 70.5% (Bailey and Rochford, 2006) and it is present in the River Mulkear. Otter is likely to also be found in the Kileengarrif River.

There are no maps available in the conservation objectives for the distribution of Sea lamprey, Brook lamprey, River lamprey or Salmon. For Sea lamprey, the conservation objectives note that artificial barriers can block or cause difficulties to lampreys upstream migration (NPWS, 2012a). Due to Sea lampreys migratory behaviour, this species must pass upstream of Limerick City in order to access suitable spawning habitat upstream (Maitland, PS, 2003). It is therefore considered that this species would be found in the Shannon downstream of the subject bridge. It is also possible for Sea lamprey to migrate up into the Mulkear River and possibly even the Kileengarrif River tributary where the subject bridge is located. Similarly, the conservation objectives do not note the extent of Brook lamprey or River

Lamprey habitat in the SAC. Brook lampreys is a freshwater species and may occur at the subject bridge site in the Kileengarrif River. Similar to Sea lampreys, River Lampreys migrate upstream passed Limerick City to freshwater areas of the SAC. River lampreys occur in the Shannon and Mulkear, downstream of the subject bridge site; but also may be present in the Kileengarrif River. Salmon are also migratory and therefore pass through the Shannon upstream of the Limerick City to freshwater to spawn. Salmon therefore also occur in the River Shannon and the River Mulkear, downstream of the subject bridge site and may be present in the Kileengarrif River too (Hendry, K & Cragg-Hine, D., 2003).

Table 1 Designated Natura 2000 Sites and associated Qualifying Interests within 15km of the proposed rehabilitation works at Kileengarrif Bridge, Co. Limerick.

Natura 2000 Site	Conservation Interests	Distance (km)
Lower River Shannon SAC (002165)	Sandbanks which are slightly covered by sea water all the time [1110]	0km
	Estuaries [1130]	
	Mudflats and sandflats not covered by seawater at low tide [1140]	
	Coastal lagoons [1150]	
	Large shallow inlets and bays [1160]	
	Reefs [1170]	
	Perennial vegetation of stony banks [1220]	
	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	
	Salicornia and other annuals colonising mud and sand [1310]	
	Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]	
	Mediterranean salt meadows (Juncetalia maritimi) [1410]	
	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]	
	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]	
	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]	
	Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]	
	Petromyzon marinus (Sea Lamprey) [1095]	
	Lampetra planeri (Brook Lamprey) [1096]	
	Lampetra fluviatilis (River Lamprey) [1099]	
	Salmo salar (Salmon) [1106]	
	Tursiops truncatus (Common Bottlenose Dolphin) [1349]	
	Lutra lutra (Otter) [1355]	
Slievefelim to Silvermines Mountains SPA (004161)	Hen harrier (Circus cyaneus) [A082]	c. 4.6km east
Glenstal Wood SAC (001432)	Trichomanes speciosum (Killarney Fern) [1421]	c. 5.3km east
Clare Glen SAC (000930)	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	c. 6.4km east
	Trichomanes speciosum (Killarney Fern) [1421]	
	Cormorant (*Phalacrocorax carbo*) [A017]	c. 11.1km west (21.7rkm
	Whooper Swan (*Cygnus cygnus*) [A038]	

Natura 2000 Site	Conservation Interests	Distance (km)
River Shannon and River Fergus Estuaries SPA (004077)	Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]	downstream via the Kileengarrif River)
	Shelduck (*Tadorna tadorna*) [A048]	
	Wigeon (*Anas penelope*) [A050]	
	Teal (*Anas crecca*) [A052]	
	Pintail (*Anas acuta*) [A054]	
	Shoveler (*Anas clypeata*) [A056]	
	Scaup (*Aythya marila*) [A062]	
	Ringed Plover (*Charadrius hiaticula*) [A137]	
	Golden Plover (*Pluvialis apricaria*) [A140]	
	Grey Plover (*Pluvialis squatarola*) [A141]	
	Lapwing (*Vanellus vanellus*) [A142]	
	Knot (*Calidris canutus*) [A143]	
	Dunlin (*Calidris alpina*) [A149]	
	Black-tailed Godwit (*Limosa limosa*) [A156]	
	Bar-tailed Godwit (*Limosa lapponica*) [A157]	
	Curlew (*Numenius arquata*) [A160]	
	Redshank (*Tringa totanus*) [A162]	
	Greenshank (*Tringa nebularia*) [A164]	
	Black-headed Gull (*Chroicocephalus ridibundus*) [A179]	
	Wetland and Waterbirds [A999]	
Glenomra Wood SAC (001013)	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	c. 12.9km north-west

5. ASSESSMENT OF EFFECTS

Table 2 below outlines the locations of the Qualifying Interests of Natura 2000 Sites within 15km of the proposed bridge rehabilitation works, as well as potential pathways for impacts.

Table 2 Designated Natura 2000 Sites within 15km of the proposed works, the potential location of Q.I.s in relation to the proposed works, potential pathways for impacts and potential impacts arising from the proposed works.

Natura 2000 Site	Qualifying Interests	Location in Relation to Subject Bridge Site	Potential Pathway for Impacts (Yes / No)	Potential for Significant Impacts
Lower River Shannon SAC (002165)	Sandbanks which are slightly covered by sea water all the time [1110]	Located c. 87rkm downstream in the Shannon estuary (Map 3 - NPWS, 2012a)	No	None - due to the large geographical distance between the proposed development site and this habitat – there is no potential for water quality impacts, disturbance, dust, or invasive species impacts to travel this far downstream – habitat is significantly separated from the proposed development
	Estuaries [1130]	Located c. 17rkm downstream of the subject bridge site (Map 4 – NPWS, 2012a)	No	None - due to the large geographical distance between the proposed development site and this habitat – there is no potential for water quality impacts, disturbance, dust, or invasive species impacts to travel this far downstream – habitat is significantly separated from the proposed development
	Mudflats and sandflats not covered by seawater at low tide [1140]	Located c. 21rkm downstream of the subject bridge site (Map 5 – NPWS, 2012a)	No	None - due to the large geographical distance between the proposed development site and this habitat – there is no potential for water quality impacts, disturbance, dust, or invasive species impacts to travel this far downstream – habitat is significantly separated from the proposed development
	Coastal lagoons [1150]	Located c. 45rkm downstream of subject bridge site (Map 6 – NPWS, 2012a)	No	None - due to the large geographical distance between the proposed development site and this habitat – there is no potential for water quality impacts, disturbance, dust, or invasive species impacts to travel this far downstream – habitat is significantly separated from the proposed development
	Large shallow inlets and bays [1160]	Located c. 87rkm downstream of subject bridge site (Map 7 – NPWS, 2012a)	No	None - due to the large geographical distance between the proposed development site and this habitat – there is no potential for water quality impacts, disturbance, dust, or invasive species impacts to travel this far downstream – habitat is significantly separated from the proposed development

Natura 2000 Site	Qualifying Interests	Location in Relation to Subject Bridge Site	Potential Pathway for Impacts (Yes / No)	Potential for Significant Impacts
	Reefs [1170]	Located c. 53rkm downstream of proposed development site (Map 8 – NPWS, 2012a)	No	None - due to the large geographical distance between the proposed development site and this habitat – there is no potential for water quality impacts, disturbance, dust, or invasive species impacts to travel this far downstream – habitat is significantly separated from the proposed development
	Perennial vegetation of stony banks [1220]	Located c. 68km west as the crow flies – closest mapped example at Ballymacrinan Bay in the conservation objectives maps (Map 10 – NPWS, 2012a)	No	None - due to the large geographical distance between the proposed development site and this habitat – there is no potential for water quality impacts, disturbance, dust, or invasive species impacts to travel this far downstream – habitat is significantly separated from the proposed development
	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	Located c. 62km west as the crow flies – closest mapped example is at Burrane in the Shannon estuary in the conservation objectives maps (Map 11 – NPWS, 2012a)	No	None - due to the large geographical distance between the proposed development site and this habitat – there is no potential for water quality impacts, disturbance, dust, or invasive species impacts to travel this far downstream – habitat is significantly separated from the proposed development
	Salicornia and other annuals colonising mud and sand [1310]	Located c. 90rkm downstream of the proposed development site (Map 12 – NPWS, 2012a)	No	None - due to the large geographical distance between the proposed development site and this habitat – there is no potential for water quality impacts, disturbance, dust, or invasive species impacts to travel this far downstream – habitat is significantly separated from the proposed development
	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	Located c. 36rkm downstream of proposed development site (Map 12 – NPWS, 2012a)	No	None - due to the large geographical distance between the proposed development site and this habitat – there is no potential for water quality impacts, disturbance, dust, or invasive species impacts to travel this far downstream – habitat is significantly separated from the proposed development
	Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	Located c.52rkm downstream of proposed development site (Map 12 – NPWS, 2012a)	No	None - due to the large geographical distance between the proposed development site and this habitat – there is no potential for water quality impacts, disturbance, dust, or invasive species impacts to travel this far downstream – habitat is significantly separated from the proposed development
	Water courses of plain to montane levels with	Present c. 15rkm downstream of the subject bridge site – *Groenlandia densa* (Map 13 – NPWS, 2012a)	No	None - due to the large geographical distance between the proposed development site and this habitat – there

Natura 2000 Site	Qualifying Interests	Location in Relation to Subject Bridge Site	Potential Pathway for Impacts (Yes / No)	Potential for Significant Impacts
	the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]			is no potential for water quality impacts, disturbance, dust, or invasive species impacts to travel this far downstream – habitat is significantly separated from the proposed development
	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]	Full extent of habitat in the SAC unknown – it is present upstream at Castleconnell – based on site visit no potential for this habitat to occur at the site – no meadow habitats present	No	None – this is a terrestrial habitat and was not found to be present at the site due to its urban nature – there are no potential pathways identified for disturbance, dust, invasive species or water quality (groundwater) impacts
	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]	Not present at the subject bridge site and not present downstream of the subject bridge (Conservation Objectives Map 14 – NPWS, 2012)	No	None - due to the large geographical distance between the proposed development site and this habitat – there is no potential for disturbance, dust, or invasive species impacts to travel this far distance – this is a terrestrial habitat and it is significantly separated from the proposed development
	Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]	Only present in the River Cloon in this SAC (Map 15 – NPWS, 2012a)	No	None – there is no downstream hydrological connection with the catchment where this species is found in the SAC – there is therefore no potential pathway for water quality, invasive species or disturbance impacts to arise that could affect this QI
	Petromyzon marinus (Sea Lamprey) [1095]	Could be present downstream of the subject bridge	Yes	Yes – due to hydrological connection and proximity of subject bridge to potential habitat there is potential for impacts – including potential disturbance impacts affecting; potential water quality impacts (run-off, spillages, waste, dust, foul water, groundwater pollution); potential invasive species impacts
	Lampetra planeri (Brook Lamprey) [1096]	Likely to be present in the Kileengarrif River at the subject bridge site	Yes	Yes – due to likely presence at / in the vicinity of the proposed works there is potential for impacts – including potential disturbance impacts; potential water quality impacts (run-off, spillages, waste, dust, foul water, groundwater pollution); potential invasive species impacts
	Lampetra fluviatilis (River Lamprey) [1099]	Likely to be present in the Kileengarrif River at the subject bridge site	Yes	Yes – due to likely presence at / in the vicinity of the proposed works there is potential for impacts – including potential disturbance impacts; potential water quality impacts (run-off, spillages, waste, dust, foul water, groundwater pollution); potential invasive species impacts

Natura 2000 Site	Qualifying Interests	Location in Relation to Subject Bridge Site	Potential Pathway for Impacts (Yes / No)	Potential for Significant Impacts
	Salmo salar (Salmon) [1106]	May be present in the Kileengarrif River and is present downstream in the River Mulkear	Yes	Yes – due to possible presence at / in the vicinity of the proposed works and hydrological connection to habitat used by the species there is potential for impacts – including potential disturbance impacts; potential water quality impacts (run-off, spillages, waste, dust, foul water, groundwater pollution); potential invasive species impacts
	Tursiops truncatus (Common Bottlenose Dolphin) [1349]	Located c. 36rkm downstream with critical habitat mapped c. 55rkm downstream (Map 16 – NPWS, 2012a)	No	None - due to the large geographical distance between the proposed development site and this species – there is therefore no potential for water quality, invasive species or disturbance impacts to arise that could affect this QI due to significant separated from the proposed development
	Lutra lutra (Otter) [1355]	Likely to use the Kileengarrif River at the bridge site and is present downstream in the River Mulkear	*Yes*	Yes – due to possible presence at / in the vicinity of the proposed works and hydrological connection to habitat used by the species there is potential for impacts – including potential disturbance impacts; potential water quality impacts (run-off, spillages, waste, dust, foul water, groundwater pollution); potential invasive species impacts
Slievefelim to Silvermines Mountains SPA (004165)	Hen Harrier (Circus cyaneus) [A082]	SPA located c. 4.6km east of proposed development site – habitat at the subject bridge site is not suitable	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
Glenstal Wood SAC (001432)	*Trichomanes speciosum* (Killarney Fern) [1421]	SAC located c. 5.3km east of subject bridge site	No	None - due to the large geographical distance between the proposed development site and this SAC – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – species is significantly separated from the proposed development
Clare Glen SAC (000930)	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	SAC located c. 6.4km east of subject bridge site	No	None - due to the large geographical distance between the proposed development site and this habitat – there is no potential for disturbance, dust, or invasive species

Natura 2000 Site	Qualifying Interests	Location in Relation to Subject Bridge Site	Potential Pathway for Impacts (Yes / No)	Potential for Significant Impacts
				impacts to travel this distance – habitat is significantly separated from the proposed development
	Trichomanes speciosum (Killarney Fern) [1421]	SAC located c. 6.4km east of subject bridge site	No	None - due to the large geographical distance between the proposed development site and this SAC – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – species is significantly separated from the proposed development
River Shannon and River Fergus Estuaries SPA (004077)	Cormorant (*Phalacrocorax carbo*) [A017]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Whooper Swan (*Cygnus cygnus*) [A038]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Light-bellied Brent Goose (*Branta bernicla hrota)* [A046]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Shelduck (*Tadorna tadorna*) [A048]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Wigeon (*Anas penelope)* [A050]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development

Natura 2000 Site	Qualifying Interests	Location in Relation to Subject Bridge Site	Potential Pathway for Impacts (Yes / No)	Potential for Significant Impacts
	Teal (*Anas crecca*) [A052]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Pintail (*Anas acuta*) [A054]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Shoveler (*Anas clypeata*) [A056]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Scaup (*Aythya marila*) [A062]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Ringed Plover (*Charadrius hiaticula*) [A137]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Golden Plover (*Pluvialis apricaria*) [A140]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Grey Plover (*Pluvialis squatarola*) [A141]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no	No	None - due to the large geographical distance between the proposed development site and this SPA – there is

Natura 2000 Site	Qualifying Interests	Location in Relation to Subject Bridge Site	Potential Pathway for Impacts (Yes / No)	Potential for Significant Impacts
		suitable habitat for this species present at the bridge		no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Lapwing (*Vanellus vanellus*) [A142]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Knot (*Calidris canutus*) [A143]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Dunlin (*Calidris alpina*) [A149]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Black-tailed Godwit (*Limosa limosa*) [A156]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Bar-tailed Godwit (*Limosa lapponica*) [A157]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Curlew (*Numenius arquata*) [A160]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this

Natura 2000 Site	Qualifying Interests	Location in Relation to Subject Bridge Site	Potential Pathway for Impacts (Yes / No)	Potential for Significant Impacts
				species is significantly separated from the proposed development
	Redshank (*Tringa totanus*) [A162]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Greenshank (*Tringa nebularia*) [A164]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Black-headed Gull (*Chroicocephalus ridibundus*) [A179]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Wetland and Waterbirds [A999]	SPA located c. 11.1km west (and 21.7rkm downstream) of the subject bridge site and no suitable habitat for this species present at the bridge	No	None - due to the large geographical distance between the proposed development site and this habitat – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
Glenomra Wood SAC (001013)	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]	SAC located c. 12.9km north-west of subject bridge site	No	None - due to the large geographical distance between the proposed development site and this habitat – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development

5.1 Assessment of potential direct impacts affecting Natura 2000 sites

5.1.1 Lower River Shannon SAC

5.1.1.1 Construction Phase

As with any construction works present within a Natura 2000 site, there is the potential for impacts. As the proposed works will take place on a bridge within a Special Area of Conservation, the Lower River Shannon SAC, designated for the presence of aquatic qualifying interests, there is the potential for direct water quality impacts to arise. The proposed works involve instream works and bunded areas within the river channel. Instream works include the removal of masonry units on the river bed, the use of concrete for erosion protection and stone works on the structure. Further works to the stone masonry on the walls, parapets, abutments etc. are required and scaffolding will be installed in the river channel to facilitate these works. There is a significant risk of increased suspended solids (particularly with the concrete and stone work involved), as well as accidental chemical / material spillages within the Kileengarrif River associated with the proposed construction works in the absence of mitigation.

It is likely that Brook / River lampreys are present in the watercourse and that Otters also utilise the river corridor at Kileengarrif Bridge. Salmon are also considered likely to be present and are known to be present downstream. These species would therefore be vulnerable to direct disturbance impacts with the proposed instream works. Mitigation measures will be required in order to reduce the potential for disturbance and water quality impacts during the construction phase. Mitigation measures cannot be provided in a Screening for Appropriate Assessment.

Due to the location of the subject bridge within the SAC, there is the potential for invasive species impacts to arise also that could directly affect the SAC. Crayfish plague is known to be present in the River Mulkear downstream and therefore could be present in the Kileengarrif River and spread to other catchments or other Natura 2000 sites. It is also noted that Giant Hogweed *Heracleum mantegazzianum* is present on the river bank at the bridge site. In the absence of mitigation this 'High Impact' invasive species could easily be spread as a result of the proposed works. Biosecurity mitigation will be required to control and minimise the invasive species impacts associated with the works. Again, mitigation cannot be provided in a Screening for Appropriate Assessment.

5.1.1.2 Operational Phase

As the bridge is an existing bridge, there is no potential for indirect operational phase impacts to arise as a result of the proposed rehabilitation works. There will be no change of use for the bridge site.

5.2 Assessment of potential indirect impacts affecting Natura 2000 sites

Indirect (or secondary) impacts are defined as effects that are "caused by and result from the activity although they are later in time or further removed in distance, but still reasonably foreseeable" (Bowers-Marriott, 1997).

5.2.1 Lower River Shannon SAC

5.2.1.2 Construction Phase

Potential indirect construction phase impacts generally concern water quality impacts that could affect the aquatic or semi-aquatic qualifying interests of the Lower River Shannon SAC and travel elsewhere in the SAC downstream of the bridge. The proposed bridge rehabilitation includes instream works, requiring bunded areas within the river channel. The concrete use and stone work involved poses the risk of increased suspended solids entering the watercourse. Potential water quality impacts concern increased siltation and turbidity during the works. Accidental spillages of oils or fuels from machinery are also a risk that would significantly impact water quality.

With a number of qualifying interests (e.g. Lamprey species, Salmon, Otter) of the Lower River Shannon SAC present in the vicinity and downstream of Kileengarrif Bridge, water quality impacts arising from the proposed bridge works would adversely affect these interests. Mitigation measures will be required to protect the water quality of the Kileengarrif River and areas of the SAC downstream. Mitigation cannot be provided in a Screening for Appropriate Assessment.

There is also the potential for invasive species impacts to arise and indirectly affect areas elsewhere in the SAC. Crayfish plague could be spread to other catchments or other Natura 2000 sites. Similarly, Giant Hogweed, which is present at the subject bridge site, could easily be spread further in the absence of appropriate biosecurity measures. Biosecurity mitigation will be required to prevent / minimise invasive species impacts arising from the works that would affect the SAC.

5.2.1.2 Operational Phase

As the bridge is an existing bridge, there is no potential for indirect operational phase impacts to arise as a result of the proposed rehabilitation works. There will be no change of use for the bridge site.

5.3 Assessment of potential cumulative impacts affecting the Natura 2000 site

Cumulative impacts or effects are changes in the environment that result from numerous human-induced, small-scale alterations. Cumulative impacts can be thought of as occurring through two main pathways: first, through persistent additions or losses of the same materials or resource, and second, through the compounding effects as a result of the coming together of two or more effects (Bowers-Marriott, 1997).

5.3.1 Lower River Shannon SAC

The standard data Natura 2000 form for the Lower River Shannon SAC lists the threats and pressures currently having an impact on this protected site (NPWS, 2017). There are no impacts listed that are

having a high impact on this SAC. The following are noted as having a medium impact on the SAC: Fertilisation, urbanised areas, human habitation, air pollution, air-borne pollutants, discharges, eutrophication (natural), grazing, polderisation, reclamation of land from sea, estuary or marsh.

The potential for water quality impacts associated with the construction phase described above could indeed act in combination with existing background pressures on water quality in the SAC. The proposed bridge works could act in combination with fertilisation and discharge impacts which also affect water quality in the SAC. Mitigation measures will be required in order to reduce the potential for impacts. It is considered that with water quality mitigation will help reduce the potential for cumulative impacts on the SAC. Mitigation cannot be provided in a Screening for Appropriate Assessment Report.

The other bridges listed for the Limerick City and County Council's proposed Bridge Rehabilitation Programme 2021, which are shown in Figure 1, are considered in terms of potential cumulative water quality impacts. Each of the bridges will be assessed with individual Screening for Appropriate Assessments where necessary. It is noted that there are no other bridges included in the proposed Bridge Rehabilitation Programme 2021 that are within the catchment of the Kileengarrif River but there may be others within the greater Lower Shannon Catchment that may have potential to impact the SAC. Any need for water quality mitigation will be identified in the individual screenings and NIS will be complete for bridges that require such to prevent potential cumulative impacts on the Lower River Shannon SAC. Water quality mitigation is expected to be implemented for any other bridge works that require such measures to reduce the risk of cumulative impacts on the downstream SAC. As stated above water quality mitigation will be put in place for the proposed Kileengarrif Bridge works to prevent contributing to any potential water quality impacts on the SAC that could arise from the proposed Bridge Rehabilitation Programme 2021.

6. SCREENING STATEMENT WITH CONCLUSIONS

According to the guidance published by the DoEHLG (2010), Screening for Appropriate Assessment can either identify that an Appropriate Assessment is not required, where a project / proposal is directly related to the management of the site; or that there is no potential for significant effects affecting the Natura 2000 network; or that significant effects are certain, likely or uncertain (i.e., the project must either proceed to Stage 2 (AA) or be rejected).

From examination of the information available, it is concluded that there is the potential for direct, indirect and cumulative impacts arising from the proposed bridge works at Kileengarrif Bridge in Co. Limerick. It has been determined that water quality and biosecurity mitigation is required for the proposed works at Kileengarrif Bridge to reduce the potential for impacts on the Lower River Shannon SAC. Mitigation measures cannot be provided in a Screening for Appropriate Assessment report. Therefore, it is concluded that a Natura Impact Statement is required for the proposed rehabilitation works at Kileengarrif Bridge.

7. OTHER ECOLOGICAL INTERESTS

7.1 Methodology

A daytime bat survey was completed at the bridge site to determine the potential for bat usage. The survey had regard to the methodology outlined in *Bat Mitigation Guidelines for Ireland* by Kelleher & Marnell (2006) and *Bat Surveys for Professional Ecologists: Good Practice Guidelines* by Collins (2016). The bridge on the site was inspected for its potential to have bats where access allowed. Any potential cracks, crevices in the bridge structure were noted. Any evidence of bat usage and / or habitation such as droppings, staining or smearing lines were also identified.

A walkover survey was also completed at the site. This general walkover survey comprised an overview of the ecological features of the site. The habitats in the immediate vicinity of the bridge were assessed, including the aquatic habitat present at the site. Checks for signs of mammal usage and potential dwellings were also carried out. In addition, checks for the presence of birds' nests at the bridge were also completed.

7.2 Results

7.2.1 Bats

The National Biodiversity Data Centre (NBDC) maps landscape suitability for bats based on Lundy *et al.,* (2011). The maps are a visualisation of the results of the analyses based on a 'habitat suitability' index. The index ranges from 0 to 100, with 0 being least favourable and 100 most favourable for bats. Table 3 below gives the suitability of the study area for the bat species found in Ireland (based on NBDC) along with their Irish Red List Status (from Marnell *et al.,* 2009). The overall assessment of bat habitats for the current study area is given as 34.

Table 3 Bat suitability index for Kileengarrif Bridge, with Irish Red List status also indicated.

Common name	Scientific name	Suitability index	Irish red list status
All bats	-	34	
Soprano pipistrelle	*Pipistrellus pygmaeus*	50	Least Concern
Brown long-eared bat	*Plecotus auritus*	47	Least Concern
Common pipistrelle	*Pipistrellus pipistrellus*	49	Least Concern
Lesser horseshoe bat	*Rhinolophus hipposideros*	8	Least Concern
Leisler's bat	*Nyctalus leisleri*	49	Near Threatened
Whiskered bat	*Myotis mystacinus*	21	Least Concern
Daubenton's bat	*Myotis daubentonii*	43	Least Concern
Nathusiius's pipistrelle	*Pipistrellus nauthusii*	3	Least Concern
Natterer's bat	*Myotis nattererii*	36	Least Concern

The nearest previous bat records to this bridge site were at Barrington's Bridge, c.1.4km to the south Kileengarrif Bridge over the same watercourse. Common pipistrelle, Soprano pipistrelle and Daubenton's bat were recorded at the site in 2008. There were also 2 Daubenton's bats recorded at Barrington's Bridge in 2010 as part of the 'All-Ireland Daubenton's Bat Waterways Survey'.

Kileengarrif Bridge is considered to have potential bat roosting habitat due to the large size of the bridge, potential crevices underneath the bridge and ivy growth. Due to the deep water at the subject bridge site, a full in-depth inspection could not be carried out during the current survey. Therefore, the presence

of bats in the subject bridge cannot be ruled out without further surveying. A bat emergence watch survey will have to be undertaken during the appropriate bat survey season to determine the importance of the bridge structure for bats. Following this survey a bat derogation licence may be required.

7.2.2 Birds

No birds' nests were recorded during the current survey in the immediate vicinity of the bridge. However, the presence of vegetation and trees on the bridge and in the vicinity of the bridge was noted and birds' nests may also be present in the bridge structure itself. The survey was undertaken during the winter season. There is therefore potential for bird nesting at the subject bridge site.

7.2.3 Non-volant Mammals

No signs of mammal activity were noted during the survey. The current survey was undertaken during the winter season during high water levels. The subject bridge site is located within the Lower River Shannon SAC. It is noted that there is potential for Otter, which is a qualifying interest of the SAC, to occur at the subject bridge site.

7.2.4 Aquatic

Salmonid habitat was noted at Kileengarrif Bridge during the current survey. It is likely that Brown trout are present and Salmon may also occur in the river. Lamprey species are also considered likely to be present in the Kileengarrif River. These aquatic species require good water quality to survive. There is potential spawning habitat upstream of the bridge. The proposed bridge works at Kileengarrif Bridge have the potential to affect the water quality in the Kileengarrif River. Previous arterial drainage works in the Kileengarrif River at this bridge site in the past had reduced the potential for salmonid habitat at the site but these species are still considered likely to be present.

7.2.5 Invasive Species

The presence of a non-native invasive plant species, Giant Hogweed *Heracleum mantegazzianum*, was recorded during the current survey. Giant Hogweed is classified as a 'High Impact' risk species. The main mechanism of impact on native species is competition. It can also affect watercourses and cause blockages with its leaves and debris in winter following die back as well as leaving river banks exposed to erosion.

Crayfish plague is also known to be present in the River Mulkear downstream, and therefore could be present in the Kileengarrif River and spread to other catchments or other Natura 2000 sites.

There is potential for the proposed rehabilitation works at Kileengarrif Bridge to spread the invasive species further in the absence of appropriate mitigation.

7.3 Recommendations

As there is the potential for bat presence at Kileengarrif Bridge, a bat activity survey must be carried out prior to works on the bridge. An emergence watch bat survey should be carried out during the active bat season, May to August / September. A derogation license may be required following the results of this survey.

Any vegetation removal works involved in the proposed bridge rehabilitation should be undertaken outside of the bird nesting season, which is from the 1st of March to the 31st of August.

A pre-construction mammal and Otter survey should take place prior to commencement of works as Otter are likely to be present. A derogation license may be required following the results of this survey.

Water quality protection measures must be in place during the proposed bridge rehabilitation works to prevent adverse impacts on the aquatic environment and species in the Kileengarrif River and / or downstream.

Strict biosecurity measures must be implemented throughout the proposed works to prevent the spread of Giant Hogweed, or any invasive species. Giant Hogweed should be removed from the site. Any machinery, tools or personnel working on site must be adequately dealt with to ensure no further spread of this species. The site should be carefully monitored throughout the proposed works to identify and treat new growth of the species. Strict biosecurity measures will be listed in the NIS required for the bridge works.

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PLATES

Plate 1 Kileengarrif River immediately dowsntream of Kileengarrif Bridge.

Plate 2 Kileengarrif River immediately uptream of Kileengarrif Bridge.

Plate 3 'High Impact' invasive species - Giant Hogweed is present at the subject brodge site.

Plate 4 Bat potential was identified at Kileengarrif Bridge with ivy cover and crevices noted during the current survey. An activity survey will help to determine if the bridge is used by bats.

Plate 5 Trails observed at the subject brodge site – considered to be those of humans accessing the river for fishing.

Plate 6 River drainage and modification works have impacted the Kileengarrif River in the past. OPW arterial drainage works on the Kileenagarrif River during 1996.

APPENDIX 1 NPWS Site Synopses

SITE NAME: LOWER RIVER SHANNON SAC
SITE CODE: 002165

This very large site stretches along the Shannon valley from Killaloe to Loop Head/ Kerry Head, a distance of some 120km. The site thus encompasses the Shannon, Feale, Mulkear and Fergus Estuaries, the freshwater lower reaches of the River Shannon (between Killaloe and Limerick), the freshwater stretches of much of the Feale and Mulkear catchments and the marine area between Loop Head and Kerry Head. The Shannon and Fergus flow through Carboniferous limestone as far as Foynes, but west of Foynes Namurian shales and flagstones redominate (except at Kerry Head, which is formed from Old Red Sandstone). The eastern sections of the Feale catchment flow through Namurian Rocks and the western stretches through Carboniferous Limestone. The Mulkear flows through Lower Palaeozoic Rocks in the upper reaches before passing through Namurian Rocks, followed by Lower Carboniferous Shales and Carboniferous Limestone. The Mulkear River itself, immediately north of Pallasgreen, passes through an area of Rhyolites, Tuffs and Agglomerates. Rivers within the subcatchment of the Feale include the Galey, Smearlagh, Oolagh, Allaughaun, Owveg, Clydagh, Caher, Breanagh and Glenacarney. Rivers within the sub-catchment of the Mulkear include the Kileenagarrif, Annagh, Newport, the Dead River, the Bilboa, Glashacloonaraveela, Gortnageragh and Cahernahallia.

The site is a candidate SAC selected for lagoons and alluvial wet woodlands, both habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for floating river vegetation, *Molinia* meadows, estuaries, tidal mudflats, Atlantic salt meadows, Mediterranean salt meadows, *Salicornia* mudflats, sand banks, perennial vegetation of stony banks, sea cliffs, reefs and large shallow inlets and bays all habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive – Bottle-nosed Dolphin, Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Atlantic salmon and Otter.

The Shannon and Fergus Estuaries form the largest estuarine complex in Ireland. They form a unit stretching from the upper tidal limits of the Shannon and Fergus Rivers to the mouth of the Shannon estuary (considered to be a line across the narrow strait between Kilcredaun Point and Kilconly Point). Within this main unit there are several tributaries with their own 'sub-estuaries' e.g. the Deel River, Mulkear River, and Maigue River. To the west of Foynes, a number of small estuaries form indentations in the predominantly hard coastline, namely Poulnasherry Bay, Ballylongford Bay, Clonderalaw Bay and the Feale or Cashen River Estuary.

Both the Fergus and inner Shannon estuaries feature vast expanses of intertidal mudflats, often fringed with saltmarsh vegetation. The smaller estuaries also feature mudflats, but have their own unique characteristics, e.g. Poulnasherry Bay is stony and unusually rich in species and biotopes. Plant species are typically scarce on the mudflats, although there are some Eel-grass beds (*Zostera* spp.) and patches of green algae (e.g. *Ulva* sp. and *Enteromorpha* sp.). The main macro-invertebrate community, which has been noted from the inner Shannon and Fergus estuaries, is a *Macoma- Scrobicularia-Nereis* community.

In the transition zone between mudflats and saltmarsh, specialised colonisers of mud predominate: swards of Common Cord-grass (*Spartina anglica*) frequently occur in the upper parts of the estuaries. Less common are swards of Glasswort (*Salicornia europaea* agg.). In the innermost parts of the estuaries, the tidal channels or creeks are fringed with species such as Common Reed (*Phragmites australis*) and Club-rushes (*Scirpus maritimus, S. tabernaemontani* and *S. triquetrus*). In addition to the

nationally rare Triangular Club-rush (*Scirpus triquetrus*), two scarce species are found in some of these creeks (e.g. Ballinacurra Creek): Lesser Bulrush (*Typha angustifolia*) and Summer Snowflake (*Leucojum aestivum*).

Saltmarsh vegetation frequently fringes the mudflats. Over twenty areas of estuarine saltmarsh have been identified within the site, the most important of which are around the Fergus Estuary and at Ringmoylan Quay. The dominant type of saltmarsh present is Atlantic salt meadow occurring over mud. Characteristic species occurring include Common Saltmarsh Grass (*Puccinellia maritima*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Sea-milkwort (*Glaux maritima*), Sea Plantain (*Plantago maritima*), Red Fescue (*Festuca rubra*), Creeping Bent (*Agrostis stolonifera*), Saltmarsh Rush (*Juncus gerardi*), Long-bracted Sedge (*Carex extensa*), Lesser Seaspurrey (*Spergularia marina*) and Sea Arrowgrass (*Triglochin maritima*). Areas of Mediterranean salt meadows, characterised by clumps of Sea Rush (*Juncus maritimus*) occur occasionally. Two scarce species are found on saltmarshes in the vicinity of the Fergus Estuary: a type of robust Saltmarsh-grass (*Puccinellia foucaudii*), sometimes placed within the compass of Common Saltmarsh-grass (*Puccinellia maritima*) and Hard-grass (*Parapholis strigosa*).

Saltmarsh vegetation also occurs around a number of lagoons within the site. The two which have been surveyed as part of a National Inventory of Lagoons are Shannon Airport Lagoon and Cloonconeen Pool. Cloonconeen Pool (4-5 ha) is a natural sedimentary lagoon impounded by a low cobble barrier. Seawater enters by percolation through the barrier and by overwash. This lagoon represents a type which may be unique to Ireland since the substrate is composed almost entirely of peat. The adjacent shore features one of the best examples of a drowned forest in Ireland. Aquatic vegetation in the lagoon includes typical species such as Beaked Tasselweed (*Ruppia maritima*) and green algae (*Cladophora* sp.). The fauna is not diverse, but is typical of a high salinity lagoon and includes six lagoon specialists (*Hydrobia ventrosa, Cerastoderma glaucum, Lekanesphaera hookeri, Palaemonetes varians, Sigara stagnalis* and *Enochrus bicolor*). In contrast, Shannon Airport Lagoon (2 ha) is an artificial saline lake with an artificial barrier and sluiced outlet. However, it supports two Red Data Book species of Stonewort (*Chara canescens* and *Chara cf. connivens*).

Most of the site west of Kilcredaun Point/Kilconly Point is bounded by high rocky sea cliffs. The cliffs in the outer part of the site are sparsely vegetated with lichens, Red Fescue, Sea Beet (*Beta vulgaris*), Sea Campion (*Silene maritima*), Thrift and Plantains (*Plantago* spp.). A rare endemic Sea Lavender (*Limonium recurvum* subsp. *pseudotranswallinum*) occurs on cliffs near Loop Head. Cliff-top vegetation usually consists of either grassland or maritime heath. The boulder clay cliffs further up the estuary tend to be more densely vegetated, with swards of Red Fescue and species such as Kidney Vetch (*Anthyllis vulneraria*) and Bird's-foot Trefoil (*Lotus corniculatus*).

The site supports an excellent example of a large shallow inlet and bay. Littoral sediment communities in the mouth of the Shannon Estuary occur in areas that are exposed to wave action and also in areas extremely sheltered from wave action. Characteristically, exposed sediment communities are composed of coarse sand and have a sparse fauna. Species richness increases as conditions become more sheltered. All shores in the site have a zone of sand hoppers at the top and below this each of the shores has different characteristic species giving a range of different shore types in the cSAC.

The intertidal reefs in the Shannon Estuary are exposed or moderately exposed to wave action and subject to moderate tidal streams. Known sites are steeply sloping and show a good zonation down the shore. Well developed lichen zones and littoral reef communities offering a high species richness in the sublittoral fringe and strong populations of *Paracentrotus lividus* are found. The communities found are

tolerant to sand scour and tidal streams. The infralittoral reefs range from sloping platforms with some vertical steps to ridged bedrock with gullies of sand between the ridges to ridged bedrock with boulders or a mixture of cobbles, gravel and sand. Kelp is very common to about 18m. Below this it becomes rare and the community is characterised by coralline crusts and red foliose algae. Flowing into the estuaries are a number of tidal rivers.

Other coastal habitats that occur within the site include the following:

- Stony beaches and bedrock shores - these shores support a typical zonation of seaweeds (*Fucus* spp., *Ascophyllum nodosum* and kelps).
- Shingle beaches - the more stable areas of shingle support characteristic species such as Sea Beet, Sea Mayweed (*Matricaria maritima*), Sea Campion and Curled Dock (*Rumex crispus*).
- Sandbanks which are slightly covered by sea water at all times – there is a known occurrence of sand/gravel beds in the area from Kerry Head to Beal Head.
- Sand dunes - a small area of sand dunes occurs at Beal Point. The dominant species is Marram Grass (*Ammophila arenaria*).

Freshwater rivers have been included in the site, most notably the Feale and Mulkear catchments, the Shannon from Killaloe to Limerick (along with some of its tributaries, including a short stretch of the Kilmastulla River), the Fergus up as far as Ennis, and the Cloon River. These systems are very different in character: the Shannon being broad, generally slow-flowing and naturally eutrophic; the Fergus being smaller and alkaline; while the narrow, fast-flowing Cloon is acid in nature. The Feale and Mulkear catchments exhibit all the aspects of a river from source to mouth. Seminatural habitats, such as wet grassland, wet woodland and marsh occur by the rivers, however, improved grassland is most common. One grassland type of particular conservation significance, *Molinia* meadows, occurs in several parts of the site and the examples at Worldsend on the River Shannon are especially noteworthy. Here are found areas of wet meadow dominated by rushes and sedges and supporting diverse and species-rich vegetation, including such uncommon species as Blue-eyed Grass (*Sisyrinchium bermudiana*) and Pale Sedge (*Carex pallescens*).

Floating river vegetation characterised by species of Water-crowfoot (*Ranunculus* spp.), Pondweeds (*Potamogeton* spp.) and the moss *Fontinalius antipyretica* arepresent throughout the major river systems within the site. The rivers contain an interesting bryoflora with *Schistidium alpicola* var. *alpicola* recorded from in-stream boulders on the Bilboa, new to county Limerick.

Alluvial woodland occurs on the banks of the Shannon and on islands in the vicinity of the University of Limerick. The woodland is up to 25m wide on the banks and somewhat wider on the largest island. The most prominent woodland type is gallery woodland where White Willow (*Salix alba*) dominates the tree layer with occasional Alder (*Alnus glutinosa*). The shrub layer consists of various willow species with sally (*Salix cinerea* ssp. *oleifolia*) and what appear to be hybrids of *S. alba* x *S. viminalis.* The herbaceous layer consists of tall perennial herbs. A fringe of Bulrush (*Typha* sp.) occurs on the riverside of the woodland. On slightly higher ground above the wet woodland and on the raised embankment remnants of mixed oak-ash-alder woodland occur. These are poorly developed and contain numerous exotic species but locally *t*here are signs that it is invading open grassland. Alder is the principal tree species with occasional Oak (*Quercus robur*), Elm (*Ulmus glabra, U. procera*), Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*) and the shrubs Guelder-rose (*Viburnum opulus*) and willows. The ground flora is species-rich.

Woodland is infrequent within the site; however Cahiracon Wood contains a strip of old Oak woodland. Sessile Oak (*Quercus petraea*) forms the canopy, with an understorey of Hazel and Holly (*Ilex*

aquifolium). Great Wood-rush (*Luzula sylvatica*) dominates the ground flora. Less common species present include Great Horsetail (*Equisetum telmeteia*) and Pendulous Sedge (*Carex pendula*).

In the low hills to the south of the Slievefelim Mountains, the Cahernahallia River cuts a valley through the Upper Silurian rocks. For approximately 2km south of Cappagh Bridge at Knockanavar, the valley sides are wooded. The woodland consists of Birch (*Betula* spp.), Hazel, Oak, Rowan (*Sorbus aucuparia*), some Ash (*Fraxinus excelsior*) and Willow (*Salix* spp.). Most of the valley is not grazed by stock, and as a result the trees are regenerating well. The ground flora feature prominent Greater wood-rush and Bilberry (*Vaccinium myrtillus*) with a typical range of woodland herbs. Where there is more light available, Bracken (*Pteridium aquilinum*) features.

The valley sides of the Bilboa and Gortnageragh Rivers, on higher ground north east of Cappamore, support patches of semi-natural broadleaf woodland dominated by Ash, Hazel, Oak and Birch. There is a good scrub layer with Hawthorn, Willow, Holly and Blackthorn (*Prunus spinosa*) common. The herb layer in these woodlands is often open with a typically rich mixture of woodland herbs and ferns. Moss species diversity is high. The woodlands are ungrazed. The hazel is actively coppiced in places.
There is a small area of actively regenerating cut away raised bog at Ballyrorheen. It is situated approx. 5km north west of Cappamore Co. Limerick. The bog contains some wet areas with good moss (*Sphagnum*) cover. Species of particular interest include the Cranberry (*Vaccinium oxycoccos*) and the White Sedge (*Carex curta*) along with two other regionally rare mosses including *S. fimbriatum*. The site is being invaded by Birch (*Betula pubescens*) scrub woodland. Both commercial forestry and the spread of rhododendron has greatly reduced the overall value of the site.

A number of plant species that are Irish Red Data Book species occur within the site; several are protected under the Flora (Protection) Order, 1999:

- Triangular Club-rush (*Scirpus triquetrus*) - in Ireland this protected species is only found in the Shannon Estuary, where it borders creeks in the inner estuary.
- Opposite-leaved Pondweed (*Groenlandia densa*) - this protected pondweed is found in the Shannon where it passes through Limerick City.
- Meadow Barley (*Hordeum secalinum*) - this protected species is abundant in saltmarshes at Ringmoylan and Mantlehill.
- Hairy Violet (*Viola hirta*) - this protected violet occurs in the Askeaton/Foynes area.
- Golden Dock (*Rumex maritimus*) - noted as occurring in the River Fergus Estuary.
- Bearded Stonewort (*Chara canescens*) - a brackish water specialist found in Shannon Airport lagoon.
- Convergent Stonewort (*Chara connivens*) - presence in Shannon Airport Lagoon to be confirmed.

Overall, the Shannon and Fergus Estuaries support the largest numbers of wintering waterfowl in Ireland. The highest count in 1995-96 was 51,423 while in 1994-95 it was 62,701. Species listed on Annex I of the E.U. Birds Directive which contributed to these totals include: Great Northern Diver (3; 1994/95), Whooper Swan (201; 1995/96), Pale-bellied Brent Goose (246; 1995/96), Golden Plover (11,067; 1994/95) and Bar-tailed Godwit (476; 1995/96). In the past, three separate flocks of Greenland White-fronted Goose were regularly found but none were seen in 1993/94. Other wintering waders and wildfowl present include Greylag Goose (216; 1995/96), Shelduck (1,060; 1995/96), Wigeon (5,976; 1995/96); Teal (2,319; 1995-96); Mallard (528; 1995/96), Pintail (45; 1995/96), Shoveler (84; 1995/96), Tufted Duck (272; 1995/96), Scaup (121; 1995/96), Ringed Plover (240; 1995/96), Grey Plover (750; 1995/96), Lapwing (24,581; 1995/96), Knot (800; 1995/96), Dunlin (20,100; 1995/96), Snipe (719,

1995/96), Black-tailed Godwit (1062; 1995/96), Curlew (1504; 1995/96), Redshank (3228; 1995/96), Greenshank (36; 1995/96) and Turnstone (107; 1995/96). A number of wintering gulls are also present, including Black-headed Gull (2,216; 1995/96), Common Gull (366; 1995/96) and Lesser Black-backed Gull (100; 1994/95).

This is the most important coastal site in Ireland for a number of the waders including Lapwing, Dunlin, Snipe and Redshank. It also provides an important staging ground for species such as Black-tailed Godwit and Greenshank.

A number of species listed on Annex I of the E.U. Birds Directive breed within the site. These include Peregrine Falcon (2-3 pairs), Sandwich Tern (34 pairs on Rat Island, 1995), Common Tern (15 pairs: 2 on Sturamus Island and 13 on Rat Island, 1995), Chough (14-41 pairs, 1992) and Kingfisher. Other breeding birds of note include Kittiwake (690 pairs at Loop Head, 1987) and Guillemot (4010 individuals at Loop Head, 1987)

There is a resident population of Bottle-nosed Dolphin in the Shannon Estuary consisting of at least 56-68 animals (1996). This is the only known resident population of this E.U. Habitats Directive Annex II species in Ireland. Otter, a species also listed on Annex II of this directive, is commonly found on the site.

Five species of fish listed on Annex II of the E.U. Habitats Directive are found within the site. These are Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*Lampetra fluviatilis*), Twaite Shad (*Allosa fallax fallax*) and Salmon (*Salmo salar*). The three lampreys and Salmon have all been observed spawning in the lower Shannon or its tributaries. The Fergus is important in its lower reaches for spring salmon while the Mulkear catchment excels as a grilse fishery though spring fish are caught on the actual Mulkear River. The Feale is important for both types. Twaite Shad is not thought to spawn within the site. There are few other river systems in Ireland which contain all three species of Lamprey.

Two additional fish of note, listed in the Irish Red Data Book also occur, namely Smelt (*Osmerus eperlanus*) and Pollan (*Coregonus autumnalis pollan*). Only the former has been observed spawning in the Shannon.

Freshwater Pearl-mussel (*Margaritifera margaritifera*), a species listed on Annex II of the E.U. Habitats Directive, occurs abundantly in parts of the Cloon River.

There is a wide range of landuses within the site. The most common use of the terrestrial parts is grazing by cattle and some areas have been damaged through overgrazing and poaching. Much of the land adjacent to the rivers and estuaries has been improved or reclaimed and is protected by embankments (especially along the Fergus Estuary). Further, reclamation continues to pose a threat as do flood relief works (e.g. dredging of rivers). Gravel extraction poses a major threat on the Feale.

In the past, Cord-grass (*Spartina* sp.) was planted to assist in land reclamation. This has spread widely, and may oust less vigorous colonisers of mud and may also reduce the area of mudflat available to feeding birds.

Domestic and industrial wastes are discharged into the Shannon, but water quality is generally satisfactory - except in the upper estuary, reflecting the sewage load from Limerick City. Analyses for

trace metals suggest a relatively clean estuary with no influences by industrial discharges apparent. Further industrial development along the Shannon and water polluting operations are potential threats.

Fishing is a main tourist attraction on the Shannon and there are a large number of Angler Associations, some with a number of beats. Fishing stands and styles have been erected in places. The River Feale is a designated Salmonid Water under the E.U. Freshwater Fish Directive. Other uses of the site include commercial angling, oyster farming, boating (including dolphin-watching trips) and shooting. Some of these may pose threats to the birds and dolphins through disturbance. Specific threats to the dolphins include underwater acoustic disturbance, entanglement in fishing gear and collisions with fast moving craft.

This site is of great ecological interest as it contains a high number of habitats and species listed on Annexes I and II of the E.U. Habitats Directive, including the priority habitat lagoon, the only known resident population of Bottle-nosed Dolphin in Ireland and all three Irish lamprey species. A good number of Red Data Book species are also present, perhaps most notably the thriving populations of Triangular Club-rush. A number of species listed on Annex I of the E.U. Birds Directive are also present, either wintering or breeding. Indeed, the Shannon and Fergus Estuaries form the largest estuarine complex in Ireland and support more wintering wildfowl and waders than any other site in the country. Most of the estuarine part of the site has been designated a Special Protection Area (SPA), under the E.U. Birds Directive, primarily to protect the large numbers of migratory birds present in winter.

APPENDIX 2 DEVELOPMENT APPLICATIONS UNIT LETTER

An Roinn Turasóireachta, Cultúir,
Ealaíon, Gaeltachta, Spóirt agus Meán
Department of Tourism, Culture,
Arts, Gaeltacht, Sport and Media

Your Ref: 201156 LCCC 2021
Our Ref: G Pre00015/2021 (Please quote in all related correspondence)

15th March 2021

Michael O'Sullivan
Punch Consulting
97 Henry Street
Limerick
V94 YC2H

Via email: mosullivan@punchconsulting.com

Re: Re: Notification to the Minister for Culture, Heritage and the Gaeltacht under the Planning and Development Act, 2000, as amended.

Re: early notification that Limerick City and County Council (LCCC) intend to carry out rehabilitation works on 11 Bridges in Limerick County in 2021

A chara

I refer to correspondence dated 21st January received in connection with the above. Outlined below are heritage-related observations/recommendations co-ordinated by the Development Applications Unit under the stated headings.

Nature Conservation

Please find below some general scoping comments for appropriate assessment screening, appropriate assessment/NIS, and for licensing requirements specific to bridge works which may assist. Please note that, should the project screen out for AA; that the comments apply to any ecological impact assessment (EcIA) or similar ecological report to be produced.

Alien invasive species

The assessment should address the issue of invasive alien plant and animal species, such as Japanese Knotweed, and detail the methods required to ensure they are not accidentally introduced or spread during construction. Information on alien invasive species in Ireland can be found at http://invasives.biodiversityireland.ie/ and at http://invasivespeciesireland.com/.

Aonad na nIarratas ar Fhorbairt
Development Applications Unit
Oifigí an Rialtais
Government Offices
Bóthar an Bhaile Nua, Loch Garman, Contae Loch Garman, Y35 AP90
Newtown Road, Wexford, County Wexford, Y35 AP90

Crayfish Plague is now present in several Irish rivers including some in Limerick, therefore it is essential that any equipment used which has the potential to carry the disease is disinfected and dried before use, pumps or other equipment that may hold water residues are particularly dangerous in this respect. Care must also be taken leaving the site that spores of the disease are not transported to any other site. All employees should also be briefed on the risk of disease transfer from and to other sites.

Bats

Bat roosts may be present in trees, buildings and bridges. Bat roosts can only be destroyed under licence under the Wildlife Acts and a derogation under the Birds and Natural Habitats Regulations and such a licence would only be given if suitable mitigation measures were implemented. Where so called bat friendly lighting is proposed as mitigation then it should be proven to work as mitigation. However please note that the recently published *Bats and Artificial Lighting in the UK, Guidance Note 08/18, Bat Conservation Trust and Institution of Lighting Professionals*, which can be downloaded from https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/, has found that artificial lighting has been found to be particularly harmful if used along river corridors, near woodland edges and near hedgerows. Therefore lighting in woodlands and ecological corridors should be avoided. The Local Authority should also consult the Eurobats Publication Series No. 8, Guidelines for consideration of bats in lighting projects, which can be downloaded from http://www.eurobats.org/publications/eurobats_publication_series

Rivers and Wetlands

Wetlands are important areas for biodiversity. Any watercourse or wetland impacted on should be surveyed for the presence of protected species and species listed on Annexes II and IV of the Habitats Directive. These species could include otters (*Lutra lutra*), which are protected under the Wildlife Acts and listed on Annexes II and IV of the Habitats Directive, Salmon (*Salmo salar*) and Lamprey species listed on Annex II of the Habitats Directive, Freshwater Pearl Mussels (*Margaritifera species*) and White-clawed Crayfish (*Austropotamobius pallipes*) which are protected under the Wildlife Acts and listed on Annex II of the Habitats Directive, Frogs (*Rana temporaria*) and Newts (*Trituris vulgaris*) protected under the Wildlife Acts and Kingfishers (*Alcedo atthis*) protected under the Wildlife Acts and listed on Annex I of the Birds Directive (Council Directive 79/409 EEC).

One of the main threats identified in the threat response plan for otter is habitat destruction (see www.npws.ie/sites/default/files/publications/pdf/2009_Otter_TRP.pdf).

In addition a 15m riparian buffer on both banks of a waterway is considered to comprise part of the otter habitat. Therefore any proposed development should be located at least 15 m away from the waterway.

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A suitable riparian habitat should be left along each watercourse. Construction work should not be allowed impact on water quality and measures should be detailed in the assessment to prevent sediment and/or fuel runoff from getting into watercourses which could adversely impact on aquatic species.

IFI should be consulted with regard to impacts on fish species and the applicant may find it useful to consult their publication entitled "Planning for watercourses in the urban environment" which can be downloaded from their web site at http://www.fisheriesireland.ie/fisheries-management-1/86-planning-for-watercourses-in-the-urban-environment-1/file .

Bridges and Flora

Masonry bridges are a valuable habitat for a myriad of saxicolous vascular, bryophyte and lichen species. Many species have as their preferred habitat such structures whilst a smaller, restricted number of rarer species are dependant solely on such structures (usually on the mortar between the masonry). There is a very good chance that cleaning the mosses off bridges and walls could have a real impact on Irish biodiversity. The recommendations below are made in the interests of maintaining this aspect of Ireland's biodiversity (recently highlighted in the publication of 'The Rare and Threatened Bryophytes of Ireland'.

Only lime mortar should be used for repointing, grouting etc. (as per NRA guidelines as stated)

The "Removal of vegetation from the bridge surface, parapets and embankments", should be carried out judiciously so as to avoid the wholesale removal of small vascular plants, bryophytes and lichens – their removal should be deemed only necessary for imperatives reasons of engineering integrity.

Note: however that a bat survey should be carried out before any pointing or grouting.

Licences

Where there are impacts on protected species and their habitats, resting or breeding places, licenses may be required under the Wildlife Acts or derogations under the Habitats Regulations. In particular bats and otters and cetaceans are strictly protected under annex IV of the Habitats Directive. A copy of Circular Letter NPWS 2/07 entitled "Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997 – strict protection of certain species/applications for derogation licences" can be found on the Departmental web site at

www.npws.ie/sites/default/files/general/circular-npws-02-07.pdf. It should be noted however that the Regulations of 1997 have since been revoked and that Part 6 of the European Communities (Birds and Natural Habitats) Regulations 2011-2015 is now the relevant part

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dealing with the protection of flora and fauna. In particular reference to Regulation 23 in the circular letter should be taken to mean Regulation 51 in the current Regulations.

In addition the applicant and the planning authority will be required to take account of species protected under sections 21, 22 and 23 of the Wildlife Acts if there are any impacts on other protected species or their resting or breeding places, such as on protected plants, or birds' nests. They will also need to be cognisant of article 5 (d) of the Birds Directive. For that reason vegetation, including hedges and trees, should not be removed during the nesting season (i.e. March 1st to August 31st).

In order to apply for any such derogations as mentioned above the results of a survey should be submitted to the National Parks and Wildlife Service of this Department. Such surveys are to be carried out by appropriately qualified person/s at an appropriate time of the year. Details of survey methodology should also be provided.

Underwater Archaeology

It is recommended that an Underwater Archaeological Impact Assessment, as described below, shall be undertaken to assess the impact on known or potential archaeology in the area of the proposed works.

Underwater Archaeological Impact Assessment should be compiled as follows:

1. The applicant is required to engage the services of a suitably qualified archaeologist to carry out an underwater archaeological assessment - to include an assessment of the river banks within the area of the proposed development. All of the surveys shall be undertaken to the specifications advised by the Department of Housing, Local Government & Heritage.
2. The archaeologist should carry out any relevant documentary research and inspect the site and undertaken a dive survey with metal detection.
3. The archaeologist should be licensed under the National Monuments Acts 1930-2004. Diving operations should be undertaken to the Health and Safety Authority's Rule under the Health and Safety at Work (Diving Operations) Regulations 1981 SI 422. and to include that the proper qualifications are held by the dive team and the proper commercial dive insurance is in place
4. Having completed the work, the archaeologist shall submit a written report to the Department of Housing, Local Government & Heritage. Where archaeological material/features are shown to be present, preservation *in situ*, preservation by record (excavation), avoidance or monitoring may be required. This Department shall advise should such matters arise.

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5. No decision shall be made until this Department has had the opportunity to evaluate the Archaeological Assessment. This Department will forward a recommendation based on the Archaeological Assessment to the Local Authority.

You are requested to send further communications to the Development Applications Unit (DAU) at **manager.dau@chg.gov.ie**, or to the following address:

The Manager
Development Applications Unit (DAU)
Government Offices
Newtown Road
Wexford
Y35 AP90

Is mise, le meas

Diarmuid Buttimer
Development Applications Unit

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