

Proposed Bridge Rehabilitation Programme 2022

Kileengarrif Bridge, Co. Limerick



NATURA IMPACT STATEMENT

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EXECUTIVE SUMMARY

The current document provides the relevant information to allow the Competent Authority to undertake an Appropriate Assessment of the proposed rehabilitation works at Kileengarriff Bridge, Co. Limerick. A 'Screening for Appropriate assessment' determined that significant impacts on the conservation objectives of the Lower River Shannon SAC were likely. The impacts identified were direct, indirect and cumulative water quality, invasive species and disturbance impacts. Mitigation to reduce or avoid these impacts are required and are set out here in this Natura Impact Statement. 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 Kileengarriff Bridge.

Kileengarriff Bridge is located over the 5th order Kileengarriff River in Murroe, Co. Limerick which is a tributary of the River Mulkear. The Kileengarriff 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. Impacts on these Qualifying Interests were identified as water quality, disturbance and invasive species. Water quality impacts could arise from increased suspended solids, contaminants entering the watercourse, spillages of oils / fuels, cement / concrete and / or root herbicide. Dewatering of areas also poses risks to water quality. Disturbance may arise through increased noise and human activity on site. There is extensive growth of the non-native invasive plant Giant Hogweed *Heracleum mantegazzianum* at the site, in the riparian zone both upstream and downstream of Kileengarriff bridge. This could be easily spread further or spread to other areas affecting the Natura 2000 network. Other Invasive species could also be introduced on site through vectors such as machinery or tools / personnel on site.

The mitigation measures include a Detailed Method Statement and CEMP following listed guidelines, limiting the footprint of the works, silt fences and sandbags, site compound not within 5m of river and on dry land, access to watercourse limited to single route, impacts to riparian habitats minimised with natural re-vegetation, timing of works outside Lamprey and Salmon spawning season, access under the bridge for Otter throughout works, works limited to daytime hours, any oiling / refuelling away from watercourse, oils / fuels in bunded tanks in site compound, machinery well maintained and checked for leaks, spill kits provided, security at site compound, tool washing / grey water stored securely until removed off site, portaloos provided and regularly maintained by licensed facility, no vegetation debris instream, works are fenced off, no concrete / cement mixing at river bank area, precast concrete used where possible, tarp or similar material placed underneath bridge to catch potential debris, no waste stored on site, chosen ecologically safe herbicide named in method statement and stored securely in site compound, site ecologist to agree 5 day weather window of low flow conditions, if pumping out water from dewatered area required, silt bags installed at end of pipes, NRA guidelines followed for biosecurity, strict biosecurity guidelines as well as detailed control measures for eradication of Giant Hogweed, sterilise all equipment / work gear that comes into contact with river, all equipment steam cleaned before arriving on site, site ecologist employed and to give site induction, and oversee set up of dry works areas and any fish species potentially caught will be translocated upstream with section 14 licence by site ecologist.

Mitigation measures proposed ensure that there are no residual impacts on the Lower River Shannon SAC. The potential impacts identified, including water quality, disturbance and invasive species, will be



successfully reduced to imperceptible in scale following the implementation of the mitigation measures in this NIS. It has therefore been concluded that following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted impacts from the proposed works, and with the implementation of the mitigation measures proposed, that the proposed works do not pose a risk adversely affecting the integrity of any Natura 2000 site, either alone or in-combination with other plans or projects.



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1. INTRODUCTION

The current document provides the relevant information to allow the Competent Authority to undertake an Appropriate Assessment of the proposed rehabilitation works at Kileengarriff Bridge, Co. Limerick. A 'Screening for Appropriate Assessment' determined that significant impacts on the conservation objectives of the Lower River Shannon SAC were likely in the absence of mitigation measures. The impacts identified were indirect and cumulative water quality, invasive species and disturbance impacts. Mitigation to reduce or avoid these impacts are required and are set out here in this Natura Impact Statement.

The preparation of this NIS for Appropriate Assessment is as 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 of European Importance and have been designated in accordance with the requirements of the EC Habitats Directive (1992) and EC Birds Directive (2009/147/EC); transposed into Irish legislation as the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011). The Habitats Directive, in combination with the Birds Directive (2009), establishes a network of internationally important sites designated for their ecological status; identified as Special Areas of Conservation (SACs) designated under the Habitats Directive for the protection of flora, fauna and habitats and as Special Protection Areas (SPAs) designated under the Birds Directive to protect rare, vulnerable and migratory birds. These sites together form a Europe-wide 'Natura 2000' network of designated sites, referred to in this report as Natura 2000 sites.

This assessment follows the Habitats Directive 92/43/EEC, Article 6(3) and the guidance published by the National Parks and Wildlife Service (DoEHLG, 2010) '*Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities*'. The current Natura Impact Statement (NIS) assesses the impact of the proposed remedial works at construction and operation stages in relation to direct, indirect and cumulative effects on the Integrity of the Natura 2000 network.

1.1 Consultation

The following statutory bodies provided information via publicly available sources for this report:

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

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 2022 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 Kileengarriff 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 risk has been assessed in the current report and potential impacts noted. Mitigation for biosecurity has also been provided in section 7.4. Giant Hogweed is present on site and mitigation is outlined for its eradication and extreme caution will be taken on site due to its highly invasive nature.



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 and is detailed in the 'Other Ecological Interests' section 7 of the Screening for Appropriate Assessment Report for Kileengarriff Bridge. The potential for bats has been identified and further surveys are required. These surveys are planned to be undertaken in the active bat survey season of 2021 and results and any required mitigations will be outlined in a standalone bat survey report.

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. Some of the above mentioned species are qualifying interests of the Lower River Shannon SAC and have been assessed in the current NIS. Other species not listed as Q.I.s were assessed in the 'Other Ecological Interests' section of the Screening for Appropriate Assessment Report. Specific mitigation has been provided for the protection of water quality, disturbance reduction and invasive species impacts in the current NIS. IFI have also been consulted by Punches Consulting for specific bridge sites in the 2021 rehabilitation programme. NRA Guidelines are specifically mentioned and only lime mortar should be used for repointing, grouting etc.

Finally, the letter from the DAU regarding Nature conservation notes the potential requirements for licenses 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. As mentioned, section 7 of the Screening for Appropriate Assessment report details surveys and results for Other Ecological Interests. The recommendations for the species covered in the 'Other Ecological Interests' section of the Screening included no works in the bird nesting season, measures in the NIS over Otter and aquatic species, biosecurity measures, and bat survey requirements. A derogation licence for bats may or may not be required following the completion of the bat survey. As noted above, a standalone bat survey report will be prepared.

1.2 Legislative context

The current assessment takes account of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora - '*The Habitats Directive*' which was transposed into Irish law by the '*European Community (Natural Habitats) Regulations 1997*' (S.I. No. 94/1997). The most recent transposition of this legislation in Ireland is the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011). The Birds Directive (2009/147/EC) which is now included in the former Regulations 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 within Special Areas of Conservation (SACs), which are designated or proposed as candidate Special Areas of Conservation (cSACs). 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 EC 'Habitats' Directive (1992) 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 addition, the European Court of Justice in Case C-127/02 (the "Waddenzee Ruling") has made a relevant ruling in relation to Appropriate Assessment and this is reflected in the current assessment:

'Any plan or project not directly connected with or necessary to the management of the site is to be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in combination with other plans or projects' and that the plan or project may only be authorised "where no reasonable scientific doubt remains as to the absence of such effects.'

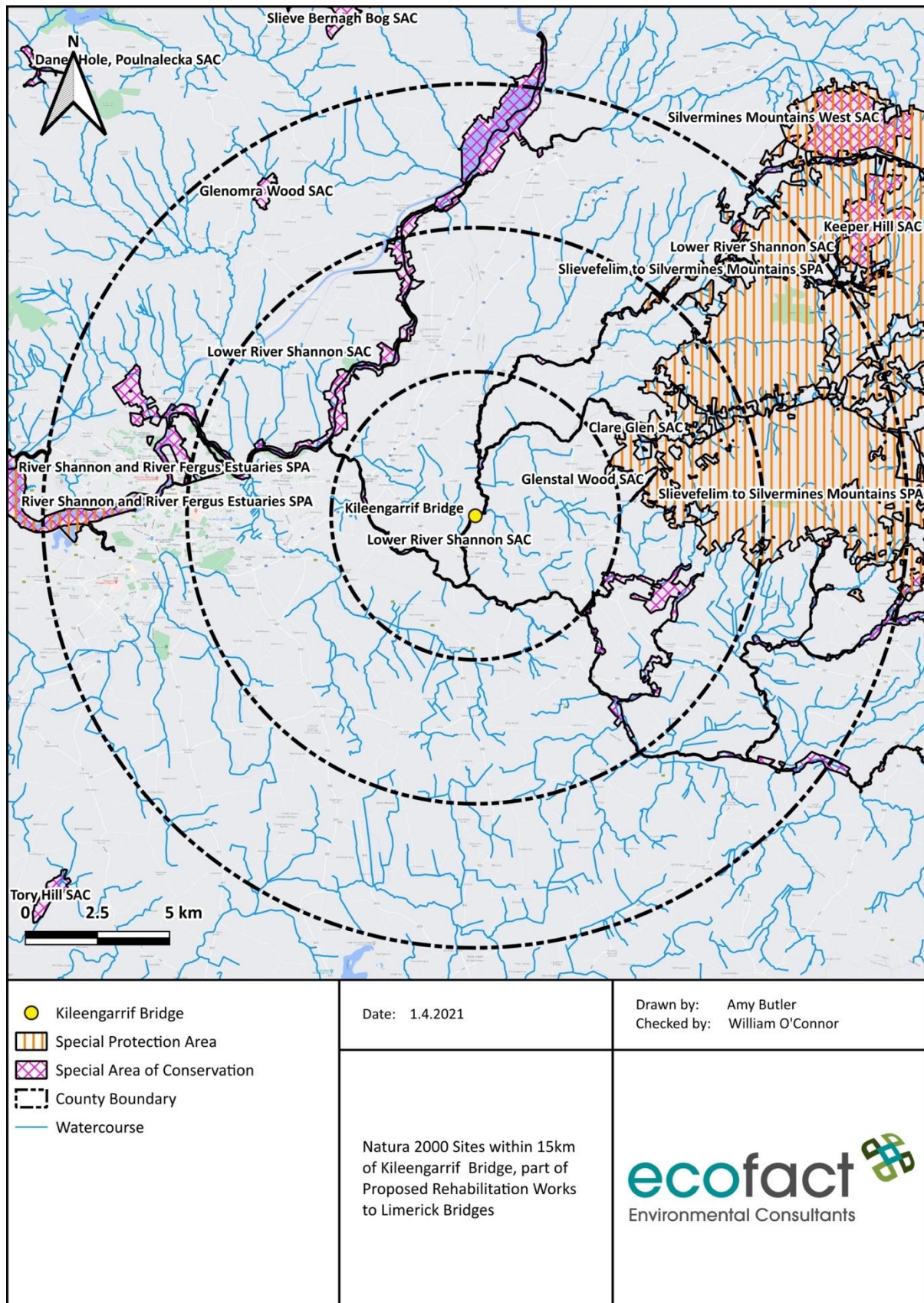


Figure 1 Natura 2000 Sites within 15km of Kileengarriff Bridge, part of Proposed Rehabilitation Works to Limerick Bridges.



2. METHODOLOGY

2.1 Desktop Review

A desktop study was undertaken to identify the extent and scope of the potentially affected Natura 2000 sites within the current study area, in relation to the proposed rehabilitation works at Kileengarriff Bridge, including the Lower River Shannon SAC. The desktop study identified the conservation interests of the designated sites with respect to the qualifying interests (species and habitats) relevant to the designated sites within the area.

A review of published literature was undertaken in order to collate data on the receiving environment; a range of additional sources of information including scientific reports produced by, and information on the websites of the EPA and NPWS were also reviewed. Information sources reviewed included the NPWS site synopses for the Lower River Shannon SAC, as well as protected species data held on the NPWS online database. The National Biodiversity Data Centre website was accessed for previous records of protected species in the area. A full bibliography of information sources reviewed is given in the reference section.

2.2 Site Survey

The proposed development site was visited in March 2021. The existing bridge was surveyed via a walkover and any evidence of ecological features of high conservation concern such as those flora and fauna that occur in the closest Natura 2000 Sites were noted. Any ecological features such as non-native invasive species were also noted.

2.3 Appropriate Assessment Methodology

The preparation of this NIS for Appropriate Assessment follows the guidance published by DoEHLG (2010) '*Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities*'. According to these guidelines, assessing the impacts of a project or plan on a Natura 2000 site is a four staged approach, as described below:

- **Stage One: Screening / Test of Significance** - The process which identifies the likely impacts upon a Natura 2000 site of a project or plan, either alone or in combination with other projects or plans and considers whether these impacts are likely to be significant.
- **Stage Two: Appropriate Assessment** - The consideration of the impact of the project or plan on the integrity of the Natura 2000 site, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts.
- **Stage Three: Assessment of Alternative Solutions** - The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site; and
- **Stage Four: Assessment Where Adverse Impacts Remain** - An assessment of compensatory measures where, in the light of an assessment of Imperative Reasons of Overriding Public Interest (IROPI), it is deemed that the project or plan should proceed.

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.

2.3.1 Natura Impact Assessment

A Natura Impact Statement (NIS) considers whether the plan or project, alone or in combination with other projects or plans, will have adverse effects on the integrity of a Natura 2000 site, and includes any mitigation measures necessary to avoid, reduce or offset negative effects. The current report is set out in the format of a NIS and comprises a scientific examination of the plan / project and the relevant Natura 2000 sites; to identify and characterize any possible implications for the site in view of the site's conservation objectives, structure and function, taking account of in combination effects. The requirements for Appropriate Assessment derive directly from Article 6(3) of the EU Habitats Directive (1992).

Direct and indirect impacts in isolation or in combination with other plans and projects on the identified Natura 2000 sites in view of the sites' conservation objectives have been examined. Case law of the European Court of Justice (ECJ) has established that Appropriate Assessment must be based on best scientific knowledge in the field. These are the qualifying interests i.e. Annex I habitats, Annex I bird species (EU Birds Directive, incorporated into the EU Habitats Directive) and Annex II species hosted by a site and for which that site has been selected. The conservation objectives for Natura sites (SACs and SPAs) are determined under Article 4 of the Habitats Directive and are intended to ensure that the relevant qualifying interests i.e., Annex I habitats, Annex I bird species and Annex II species present within the designated sites are maintained in a favourable condition. The current assessment of the proposed remedial works at Kileengarriff Bridge provides a description of the project and the receiving environment. The conservation objectives of the Natura 2000 site potentially affected by the proposed works are listed and potential impacts outlined with respect to the integrity of the Natura 2000 site. Mitigation measures have been proposed for the protection of the conservation interests and the avoidance of impacts to Natura 2000 Sites occurring within the study area.

3. DESCRIPTION OF THE PROJECT

Limerick City & County Council proposed to undertake rehabilitation works at several bridges as part of the Rehabilitation Programme for 2021. The proposed works at Kileengarriff 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 Kileengarriff Bridge rehabilitation works.

The required rehabilitation works for Kileengarriff 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 roadside drainage; additional traffic signs; etc.

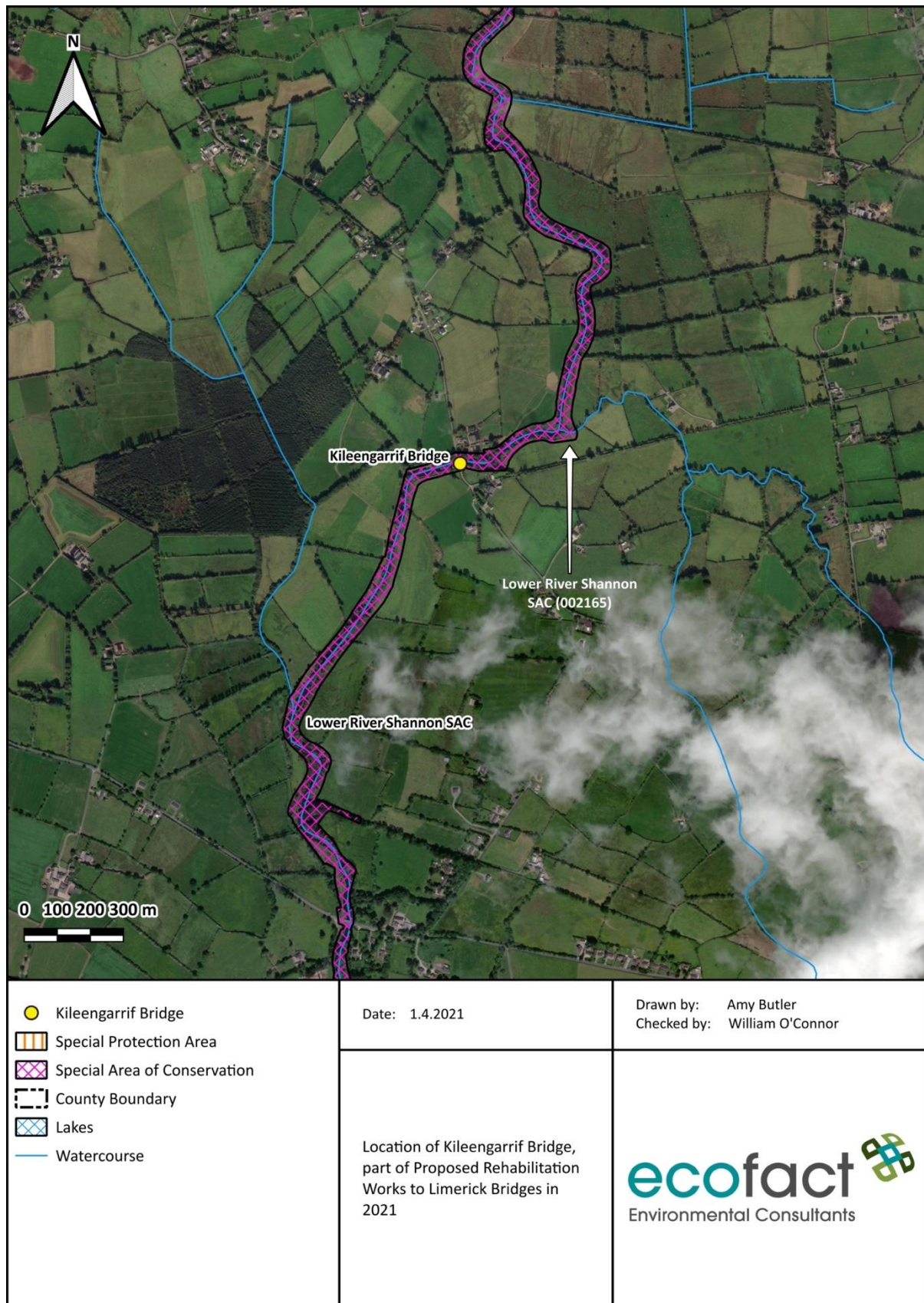


Figure 2 Location of Kileengarriff Bridge, part of Proposed Rehabilitation Works to Limerick Bridges.



4. RECEIVING ENVIRONMENT

4.1 Introduction

Figure 2 shows the location of the proposed bridge works. Kileengarriff Bridge is located over the 5th order Kileengarriff River in Murroe, Co. Limerick, which is a tributary of the River Mulkear. This is located within the boundary of the Lower River Shannon SAC. Kileengarriff Bridge is located over a small unnamed road, north of the R506. The bridge site is surrounded by mostly agricultural land and improved agricultural grassland fields, as well as some one-off residential housing. There is a small fishing trail located on the downstream side of the bridge. There is a further farming access track on the downstream side. There is some riparian woodland present mostly on the upstream side, and some other treelines in the wider area. The riparian area is heavily colonized by Giant Hogweed *Heracleum mantegazzium*.

4.2 Watercourses

Kileengarriff Bridge is located over the Kileengarriff River (EPA Segment Code: 25_13212). The River Newport [Tipperary] (EPA Segment Code 25_503) and the River Annagh [Tipperary] (EPA Segment Code: 25_209) join together approximately 2rkm upstream of Kileengarriff Bridge, to form Kileengarriff River. The smaller Eyre Bridge River (EPA Segment Code: 25_506) joins the Kileengarriff River just c. 330m upstream of the bridge site. After Kileengarriff Bridge, the river flows in a southerly direction for c. 1.6rkm until it reaches the R506 where Barringtons Bridge is located. After this point it flows for a further c. 990m before it flows into the River Mulkear (EPA Segment Code: 25_2042). The River Mulkear then flows in a north-westerly direction for c. 8.4rkm before it reaches the Lower River Shannon (EPA Segment Code: 25_1203). The Lower River Shannon then flows in a westerly direction through Limerick City before flowing into the Shannon Estuary.

4.2.1 Water Quality

The EPA carry out biological water quality monitoring on the River Kileengarriff. The closest station upstream of the bridge site was rated as Q4 in 2002, corresponding to WFD status 'Good' (EPA Station Code: 25N02 0500). This station is located on the Newport River immediately upstream of the River Annagh confluence. There is a monitoring station at Kileengarriff River, which was rated as Q4 in 2018, corresponding to WFD status 'Good' (EPA Station Code: 25K02 0150). There is another monitoring station at Barringtons Bridge downstream, but it is not been monitored since 1987. Nonetheless, this station was rated as Q4-5, corresponding to WFD Status 'High' (EPA Station Code: 25K02 0200).

The closest station on the River Mulkear upstream of the Kileengarriff confluence was rated as Q4 in 2018 (EPA Station Code: 25M04 0400), which is c. 1.9rkm upstream of this confluence. The closest station downstream on the River Mulkear was rated as Q4-5 in 2002, corresponding to WFD Status 'High' (EPA Station Code: 25M04 0500). This station is c. 4rkm downstream of the Kileengarriff Confluence. The EPA's most recent assessment of the Kileengarriff River is: '*Continuing satisfactory*', from 2018.

The Newport WwTP discharges into the River Newport [Tipperary] c. 5.4rkm before joining the River Annagh to form the Kileengarriff River. This is noted on the EPA online maps to have a design p.e. of 1900 and is currently treating a p.e. of 2472, indicating it is operating over capacity. The AER for 2019 noted that there were 4 complaints of a blocked sewer in 2019, and there is a breach of Emission Limit Values as the WwTP is not designed for P removal (Irish Water, 2019a).



The Castletroy WwTP (D0019) discharges into the Lower River Shannon upstream of Limerick City, and c. 2.7km downstream of the River Mulkear confluence. This WwTP is noted to have a design p.e. of 45,000 and serves an agglomeration of 39938 p.e. according to the online EPA maps. This WwTP has Tertiary P removal treatment. The Annual Environmental Report (AER) for 2019 noted that there had been a blocked sewer incident reported at the plant, as well as a breach of ELVs, pump failures and plant or equipment breakdowns at the WwTP (Irish Water, 2019b).

There is also the Bunlicky / Limerick WwTP, located downstream in the Shannon Estuary just downstream of Limerick City. This WwTP also discharges into the SAC. A Site Visit Report from 2020 by the EPA noted that there had been several Emission Limit Value breaches, including cBOD, COD and suspended solids. There was also an incident noted in the report for unreported hazardous waste at the plant involving a black oily substance, including a corrective action to remove and investigate it. The site visit report also notes an illegal and unauthorized discharge to ground on site (EPA, 2020).

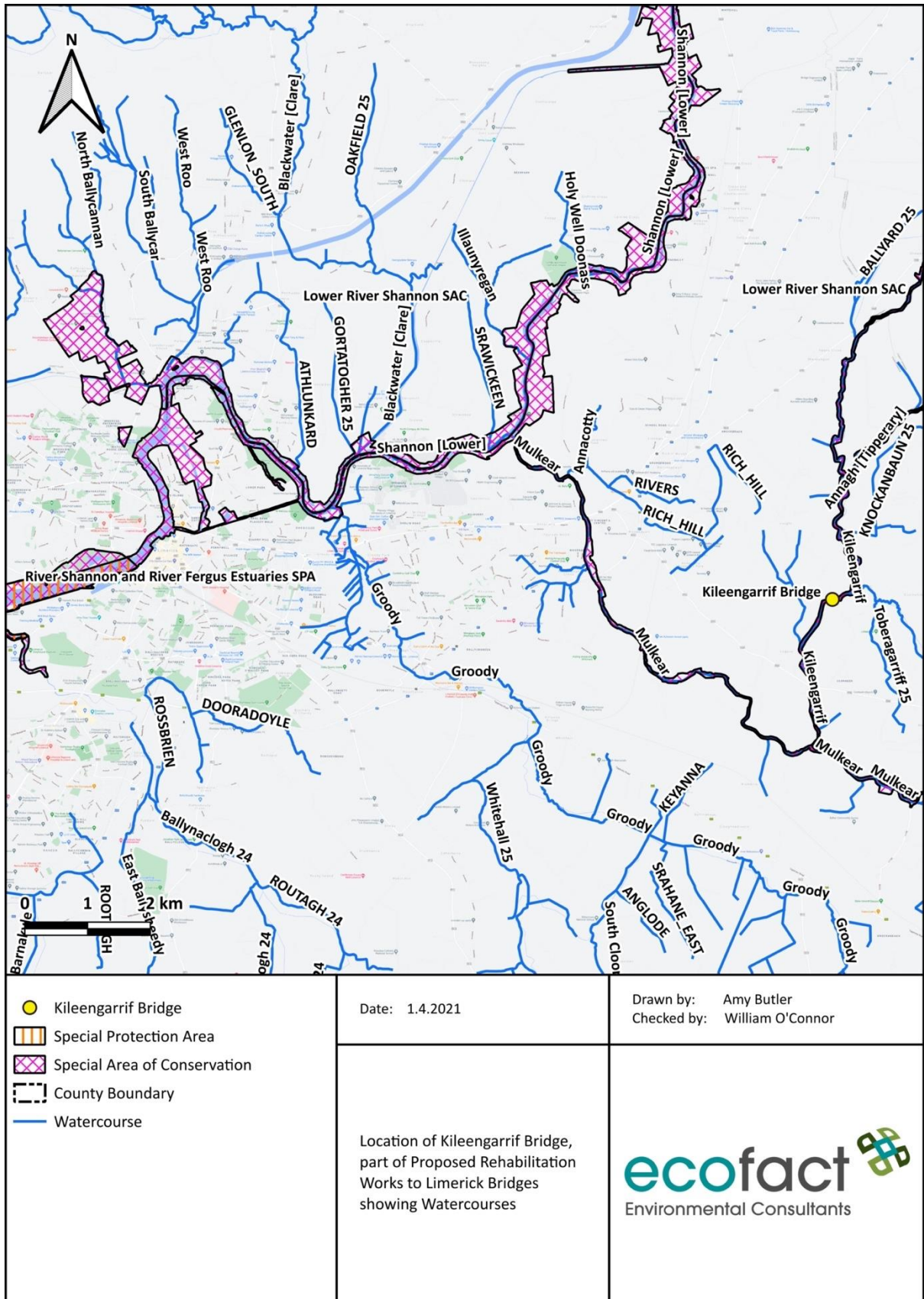


Figure 3 Location of Kileengarriff Bridge, part of the Proposed Rehabilitation Works to Limerick Bridges showing Watercourses.



4.3 Description of the Natura 2000 Sites affected

4.3.1 Lower River Shannon SAC

Lower River Shannon SAC stretches from Killaloe, Co. Clare to Loop Head/Kerry head. It is designated for a wide range of habitats and species including Alluvial Forests, Molinia Meadows, Atlantic Salmon (*Salmo salar*) and Otter (*Lutra lutra*). The freshwater part of this SAC includes the main River Shannon channel and several tributaries. Molinia meadows dominated by rushes (*Juncus* spp.) and sedges (*Carex* spp.) with a high biodiversity of vegetation and important species like Blue-eyed Grass (*Sisyrinchium bermudiana*) and Pale Sedge (*C. pallescens*) are present. Alluvial woodlands are present around the University of Limerick. All three Irish Lamprey species occur in this SAC as do Twaite Shad (*Allosa fallax fallax*) and Salmon (*Salmo salar*). Other notable fish species include Smelt (*Osmerus eperlanus*) and Pollan (*Coregonus autumnalis pollan*). Much of the land has been improved or reclaimed and flood protection is common. Domestic and industrial waste in Limerick is an ongoing threat. In the Shannon estuary part of the SAC there are several species protected under Annex I of the E.U. Birds Directive.

4.3.1.1 Annex I Habitats

4.3.1.1.1 *Sandbanks which are slightly covered by seawater all the time*

This habitat is located over c. 87rkm downstream in the Shannon estuary according to the conservation objectives map 3 for the SAC (NPWS, 2012). The Screening for Appropriate Assessment did not identify any potential pathway for impacts on this habitat in the SAC due to distance.

4.3.1.1.2 *Estuaries*

This habitat is located over c. 17rkm downstream according to the conservation objectives map 4 for the SAC (NPWS, 2012). The Screening for Appropriate Assessment did not identify any potential pathway for impacts on this habitat in the SAC due to distance.

4.3.1.1.3 *Mudflats and sandflats not covered by seawater at low tide*

This habitat is located over c. 21rkm downstream according to the conservation objectives map 5 for the SAC (NPWS, 2012). The Screening for Appropriate Assessment did not identify any potential pathway for impacts on this habitat in the SAC due to distance.

4.3.1.1.4 *Coastal Lagoons*

This habitat is located over c. 45rkm downstream in the Shannon estuary, according to the conservation objectives map 6 for the SAC (NPWS, 2012). The Screening for Appropriate Assessment did not identify any potential pathway for impacts on this habitat in the SAC due to distance.

4.3.1.1.5 *Large Shallow Inlets and Bays*

This habitat is located over c. 87rkm downstream in the Shannon estuary, according to the conservation objectives map 7 for the SAC (NPWS, 2012). The Screening for Appropriate Assessment did not identify any potential pathway for impacts on this habitat in the SAC due to distance.



4.3.1.1.6 *Reefs*

This habitat is located over c. 53rkm downstream in the Shannon estuary, according to the conservation objectives map 8 for the SAC (NPWS, 2012). The Screening for Appropriate Assessment did not identify any potential pathway for impacts on this habitat in the SAC due to distance.

4.3.1.1.7 *Perennial Vegetation of Stony Banks*

This terrestrial habitat is located at its closest point c. 68km west of the bridge site at Ballymacrinan Bay, according to the conservation objectives map 10 for the SAC (NPWS, 2012). The Screening for Appropriate Assessment did not identify any potential pathway for impacts on this habitat in the SAC due to distance.

4.3.1.1.8 *Vegetated sea cliffs of the Atlantic and Baltic Coasts*

This terrestrial habitat is located at its closest point c. 62km west of the bridge site at Burrane, according to the conservation objectives map 11 for the SAC (NPWS, 2012). The Screening for Appropriate Assessment did not identify any potential pathway for impacts on this habitat in the SAC due to distance.

4.3.1.1.9 *Salicornia and other annuals colonising mud and sand*

This habitat is located over c. 90rkm downstream in the Shannon estuary, according to the conservation objectives map 12 for the SAC (NPWS, 2012). The Screening for Appropriate Assessment did not identify any potential pathway for impacts on this habitat in the SAC due to distance.

4.3.1.1.10 *Atlantic salt meadows (Glauco-Puccinellietalia maritimae)*

This habitat is located over c. 36rkm downstream, according to the conservation objectives map 12 for the SAC (NPWS, 2012). The Screening for Appropriate Assessment did not identify any potential pathway for impacts on this habitat in the SAC due to distance.

4.3.1.1.11 *Mediterranean Salt Meadows (Juncetalia maritimi)*

This habitat is located over c. 52rkm downstream in the estuary, according to the conservation objectives map 12 for the SAC (NPWS, 2012). The Screening for Appropriate Assessment did not identify any potential pathway for impacts on this habitat in the SAC due to distance.

4.3.1.1.12 *Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation*

The habitat in the SAC is mapped as being located c. 15rkm downstream of the bridge site, with *Groenlandia densa* present, according to the conservation objectives map 13 for the SAC (NPWS, 2012). The Screening for Appropriate Assessment did not identify any potential pathway for impacts on this habitat in the SAC due to distance.

4.3.1.1.13 *Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)*

The full extent of this habitat in the SAC is unknown but this is a terrestrial habitat and was not found to be present at the site or in the immediate surrounds (NPWS, 2012). The Screening for Appropriate Assessment did not identify any potential pathway for impacts on this habitat in the SAC.



4.3.1.1.14 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

The terrestrial habitat in the SAC is mapped and is not present downstream of the bridge site or in the vicinity (NPWS, 2012). The Screening for Appropriate Assessment did not identify any potential pathway for impacts on this habitat in the SAC.

Table 1 Habitats listed as qualifying interests of the Lower River Shannon SAC.

Natura Code	Qualifying Interest	Occurrence in the study area
1110	Sandbanks which are slightly covered by seawater all the time	X
1130	Estuaries	X
1140	Mudflats and sandflats not covered by seawater at low tide	X
1150	Coastal Lagoons	X
1160	Large Shallow Inlets and Bays	X
1170	Reefs	X
1220	Perennial Vegetation of Stony Banks	X
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	X
1310	Salicornia and other annuals colonising mud and sand	X
1330	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>)	X
1410	Mediterranean Salt Meadows (<i>Juncetalia maritimi</i>)	X
3260	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	X
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>)	X
91E0	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>)	X

4.3.1.2 Annex II Species

4.3.1.2.1 Freshwater Pearl Mussel

This species is only located in the River Cloon within the Lower River Shannon SAC, according to the conservation objectives map 15 (NPWS, 2012). There is no known record of this species downstream of the bridge site. The Screening for Appropriate Assessment did not identify any potential pathway for impacts on this species in the SAC.

4.3.1.2.2 Sea lamprey

This is a migratory species and would pass through the Shannon estuary travelling upstream (Maitland, PS, 2003). This species may be present in the Kileengarriff River and is known to be present downstream. The Screening for Appropriate Assessment identified the potential for impacts on this species.

4.3.1.2.3 Brook lamprey

This species is known to occur in the Kileengarriff River and is also present downstream. This species could be affected by impacts arising from the proposed rehabilitation works. The Screening for Appropriate Assessment identified the potential for impacts on this species.



4.3.1.2.4 *River lamprey*

This is a migratory species and would pass through the Shannon estuary travelling upstream (Maitland, PS, 2003). This species is known to occur in the Kileengarriff River and is also present downstream. This species could be affected by impacts arising from the proposed rehabilitation works. The Screening for Appropriate Assessment identified the potential for impacts on this species.

4.3.1.2.5 *Salmon*

This is a migratory species and would pass through the Shannon estuary travelling upstream (Hendy, K & Cragg-Hine, D, 2003). This species may be present in the Kileengarriff River downstream of the bridge site and is present in the River Mulkear downstream. The Screening for Appropriate Assessment identified the potential for impacts on this species.

4.3.1.2.6 *Common Bottlenose Dolphin*

This species would be located over c. 36rkm in the Shannon estuary, according to the conservation objectives map 16 for the SAC (NPWS, 2012). This map shows that its critical habitat is located c. 55rkm downstream of the bridge site (NPWS, 2012). The Screening for Appropriate Assessment did not identify any potential pathway for impacts on this species in the SAC.

4.3.1.2.7 *Otter*

This species is considered likely to use the River Kileengarriff and also uses the River Mulkear downstream. The Screening for Appropriate Assessment identified the potential for impacts on this species.

Table 2 Species listed as qualifying interests of the Lower River Shannon SAC.

Natura Code	Qualifying Interest	Occurrence in the study area
1029	Freshwater Pearl Mussel	X
1096	Sea lamprey	✓
1096	Brook lamprey	✓
1099	River lamprey	✓
1106	Salmon	✓
1349	Common Bottlenose Dolphin	X
1355	Otter	✓



5. IMPACT ASSESSMENT

At NIS stage, mitigation to offset potential negative impacts can be provided. In addition, the impact of the project / plan affecting the integrity of a Natura 2000 site is considered with respect to the conservation objectives of the site. Integrity is defined as: 'the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified'. Therefore, the integrity of a site is principally related to the structure and function of the site with regard to its Annex I habitats and Annex II species listed as the qualifying interests. The conservation status of these qualifying interests comprises the primary conservation objectives for all designated Natura 2000 sites.

5.1 Lower River Shannon SAC

The affected qualifying interests of the Lower River Shannon SAC are presented in Table 3 below with the potential impacts of the proposed works on each and the type of mitigation measures required. The qualifying interests are discussed individually below in terms of the potential impacts that could arise from the proposed works.

Table 3 Potential impacts on the affected qualifying interests of the Lower River Shannon SAC arising from the proposed rehabilitation works at Kileengarriff Bridge.

	Natura Code	Qualifying Interest	Impacts
Annex I Habitats	1130	Estuaries	Water quality; Invasive Species
	3260	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	Water quality; Invasive Species
Annex II Species	1095	Sea lamprey <i>Petromyzon marinus</i>	Water quality; Invasive Species
	1096	Brook lamprey <i>Lampetra planeri</i>	Water quality; Invasive Species; Disturbance
	1099	River lamprey <i>Lampetra fluviatilis</i>	Water quality; Invasive Species; Disturbance
	1106	Salmon <i>Salmo salar</i>	Water quality; Invasive Species
	1355	Otter <i>Lutra lutra</i>	Water quality; Invasive Species; Disturbance

5.1.1 Annex II Species

5.1.1.1 Sea lamprey

5.1.1.1.1 Construction Phase

This is a migratory species and would pass through the Shannon estuary travelling upstream (Maitland, PS, 2003). This species may be present in the Kileengarriff River and is known to be present downstream. This species could be affected by indirect water quality and invasive species impacts.

If Sea lamprey are present at the site, they could be directly affected by trampling or getting trapped behind sandbags during the dewatering process, which could lead to mortality. Sea lamprey could also be affected by water quality impacts arising from the proposed rehabilitation works. Water quality issues could arise from an increase in suspended solids and / or contaminants in the watercourse which can be generated by the activities at the works site. The proposed bridge rehabilitation at Kileengarriff includes instream works, requiring bunded areas within the river channel, with the use of concrete / cement and stonework also required. Removing debris is also likely to be required. Water quality impacts can also come from accidental spillages of oil / fuel, cement / concrete and / or root herbicide



that may be used for the bridge rehabilitation works. There is a risk of concrete / cement spillages instream which can alter the pH of watercourses. Dewatering of areas also poses risks to water quality. In such situations there is also a risk of water quality impacts arising from the potential accidental release of sand into the river from sandbags used around dewatered areas in the event of a flood. Any water pollution will affect lampreys and habitats downstream.

Machinery and personnel working on site could also lead to the introduction of invasive species to the site. Invasive species can quickly take over an ecosystem and disrupt the balance of the system. Invasive species can also spread rapidly and could affect the habitats that Sea lampreys utilize downstream. In the absence of any biosecurity mitigation, this could be a significant impact.

5.1.1.1.2 Operational Phase

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

5.1.1.2 Brook lamprey

5.1.1.2.1 Construction Phase

This species is known to occur in the Kileengarriff River and is also present downstream. This species could be affected by impacts arising from the proposed rehabilitation works, such as water quality, disturbance and invasive species impacts.

Brook lamprey present at the site could be directly affected by trampling or getting trapped behind sandbags during the dewatering process, which could lead to mortality. Brook lamprey, similarly to sea lamprey, could be affected by water quality impacts arising from the proposed rehabilitation works. Water quality issues could arise from an increase in suspended solids and / or contaminants in the watercourse which can be generated by the activities at the works site. The proposed bridge rehabilitation at Kileengarriff includes instream works, requiring bunded areas within the river channel, with the use of concrete / cement and stonework also required. Removing debris is also likely to be required. Water quality impacts can also come from accidental spillages of oil / fuel, cement / concrete and / or root herbicide that may be used for the bridge rehabilitation works. There is a risk of concrete / cement spillages instream which can alter the pH of watercourses. Dewatering of areas, if required, also poses risks to water quality. In such situations there is also a risk of water quality impacts arising from the potential accidental release of sand into the river from sandbags used around dewatered areas in the event of a flood. Any water pollution will affect lampreys and habitats downstream. If present at the site, this species could also be affected by disturbance during instream works.

Machinery and personnel working on site could also lead to the introduction of invasive species to the site. Invasive species can quickly take over an ecosystem and disrupt the balance of the system. Invasive species can also spread rapidly and could affect the habitats that Brook lampreys utilize downstream. In the absence of any biosecurity mitigation, this could be a significant impact.

5.1.1.2.2 Operational Phase

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



5.1.1.3 River lamprey

5.1.1.3.1 Construction Phase

This is a migratory species and would pass through the Shannon estuary travelling upstream (Maitland, PS, 2003). This species is known to occur in the Kileengarriff River and is also present downstream. This species could be affected by impacts arising from the proposed rehabilitation works, such as water quality, disturbance and invasive species impacts.

Impacts on River lamprey are the same as those discussed for Brook lamprey in section 5.1.1.2 above. This species could be impacted by water quality issues arising from the works at the site, or by disturbance and / or mortality. This species could also be affected by any invasive species impacts as this could degrade their habitat.

5.1.1.3.2 Operational Phase

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

5.1.1.4 Salmon

5.1.1.4.1 Construction Phase

This is a migratory species and would pass through the Shannon estuary travelling upstream (Hendy, K & Cragg-Hine, D, 2003). This species may be present in the Kileengarriff River downstream of the bridge site and is present in the River Mulkear downstream. This species could be affected by indirect water quality and invasive species impacts.

If Salmon are present at the site, they could be directly affected by trampling or getting trapped behind sandbags during the dewatering process, which could lead to mortality. Water quality issues could arise from an increase in suspended solids and / or contaminants in the watercourse which can be generated by the activities at the works site. The proposed bridge rehabilitation at Kileengarriff includes instream works, requiring bunded areas within the river channel, with the use of concrete / cement and stonework also required. Removing debris is also likely to be required. Water quality impacts can also come from accidental spillages of oil / fuel, cement / concrete and / or root herbicide that may be used for the bridge rehabilitation works. There is a risk of concrete / cement spillages instream which can alter the pH of watercourses. Dewatering of areas, if required, also poses risks to water quality. In such situations there is also a risk of water quality impacts arising from the potential accidental release of sand into the river from sandbags used around dewatered areas in the event of a flood. Any water pollution will affect salmon and their habitats downstream.

Machinery and personnel working on site could also lead to the introduction of invasive species to the site. Invasive species can quickly take over an ecosystem and disrupt the balance of the system. Invasive species can also spread rapidly and could affect the habitats that Salmon utilize. In the absence of any biosecurity mitigation, this could be a significant impact.

5.1.1.4.2 Operational Phase

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



5.1.1.5 Otter

5.1.1.5.1 Construction Phase

This species is considered likely to use the River Kileengarriff and also uses the River Mulkear downstream. This species could be affected by impacts arising from the proposed rehabilitation works, such as water quality, disturbance and invasive species impacts.

Water quality issues could arise from an increase in suspended solids and / or contaminants in the watercourse which can be generated by the activities at the works site. The proposed bridge rehabilitation at Kileengarriff includes instream works, requiring bunded areas within the river channel, with the use of concrete / cement and stonework also required. Removing debris is also likely to be required. Water quality impacts can also come from accidental spillages of oil / fuel, cement / concrete and / or root herbicide that may be used for the bridge rehabilitation works. There is a risk of concrete / cement spillages instream which can alter the pH of watercourses. Dewatering of areas, if required, also poses risks to water quality. In such situations there is also a risk of water quality impacts arising from the potential accidental release of sand into the river from sandbags used around dewatered areas in the event of a flood. Any water pollution will affect Otters food sources, i.e. fish, and therefore can result in an indirect impact on this species. If Otters are present at the site, they could also be affected by disturbance impacts through the increase in noise and human activity for the duration of the construction works on site.

Machinery and personnel working on site could also lead to the introduction of invasive species to the site. Invasive species can quickly take over an ecosystem and disrupt the balance of the system. Invasive species can also spread rapidly and could affect the habitats that otters utilize, particularly riparian areas as this is a semi-aquatic species. In the absence of any biosecurity mitigation, this could be a significant impact.

5.1.1.5.2 Operational Phase

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



6. POTENTIAL FOR IN-COMBINATION EFFECTS

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. 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 and reclamation of land from sea, estuary or marsh.

A search for planning applications was carried out on the online National Planning Applications Database (NPAD). There is a planning application for a residential development on the south and upstream side of the Kileengarriff River adjacent to the bridge site (Planning Ref No.: 20587). This application is from 2020 and is for the demolition of existing single storey lean-to extension to rear, alterations to fenestration to front elevation, stone cladding to existing porch, new part two storey part single storey extension to side with car port, new on-site wastewater treatment system and all ancillary site works. There is no Screening for Appropriate Assessment or Natura Impact Statement available online for the proposed development and this planning has been granted on conditions, although it was referred to the Development Applications Unit for potential impacts on the Lower River Shannon SAC.

The closest EPA Biological Water Quality Monitoring station on the River Mulkear upstream of the Kileengarriff confluence was rated as Q4 in 2018 (EPA Station Code: 25M04 0400), which is c. 1.9km upstream of this confluence. The closest station downstream on the River Mulkear was rated as Q4-5 in 2002, corresponding to WFD Status 'High' (EPA Station Code: 25M04 0500). This station is c. 4rkm downstream of the Kileengarriff Confluence. The Newport WwTP discharges into the River Newport [Tipperary] c. 5.4rkm before joining the River Annagh to form the Kileengarriff River. The Castletroy WwTP (D0019) discharges into the Lower River Shannon upstream of Limerick City, and c. 2.7rkm downstream of the River Mulkear confluence. The Annual Environmental Report (AER) for 2019 noted that there had been a blocked sewer incident reported at the plant, as well as a breach of ELVs, pump failures and plant or equipment breakdowns at the WwTP (Irish Water, 2019b). There is also the Bunlicky / Limerick WwTP, located downstream in the Shannon Estuary just downstream of Limerick City. This WwTP also discharges into the SAC.

The National Invasive Species database was accessed from the National Biodiversity Data Centre online maps. There are records of Japanese Knotweed *Fallopia japonica* downstream of Kileengarriff Bridge from 2018. Furthermore, during the site visits to Kileengarriff Bridge, extensive Giant Hogweed *Heracleum mantegazzium* growth was noted on both sides of the river both upstream and downstream of the site.

Taking the above information into account, concerning background pressures in the area and the list of threats and pressures on the SAC downstream of Kileengarriff bridge, there is some potential for cumulative water quality and invasive species impacts to arise. These impacts could act in-combination with existing WwTP discharges in the catchment, the pressures of fertilisation, discharges, grazing and human habitation. Water quality impacts may arise during the rehabilitation works at Kileengarriff Bridge, which could travel downstream and result in a larger impact cumulatively with the existing pressures on the catchment and SAC. It is considered that with the mitigation measures outlined in this NIS to protect water quality, cumulative impacts will not be significant. Furthermore, invasive species are present at the site and in the wider study area and could be brought in by machinery and / or personnel gaining access to the bridge site. With the implementation of biosecurity measures on site, this risk will be reduced to imperceptible.



7. MITIGATION

Mitigation measures for the protection of the Lower River Shannon SAC and their qualifying interests have been prepared. The proposed rehabilitation works to Kileengarriff Bridge have been identified as having some potential to cause water quality, disturbance and invasive species impacts affecting the qualifying interests of this site.

7.1 Detailed Method Statement and CEMP

Prior to commencement of works a site specific Construction and Environmental Management Plan and Method Statement must be drawn up detailing precisely how the works will be carried out in compliance with the necessary mitigation measures. These documents will provide the precise details of the works to be undertaken and how each process and each step of the works will be carried out to adhere to the mitigation measures: timing of works, limiting access outside of the proposed works area, biosecurity protocols and water quality protection measures. The CEMP and Method Statement will be prepared following best practice procedure and guidelines, having due regard to the relevant sections of the following:

- IFI, (2010) '*Biosecurity Protocol for Field Survey Work*'
- IFI, (2016) '*Guidelines of protection of Fisheries during construction works in and adjacent to waters*'
- NRA, (2010) '*The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads*'
- NRA, (2008) '*Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes*'
- CIRIA (2006) '*Control of Water Pollution from Linear Construction Projects- Site Guide (C649)*'
- CIRIA (2005) '*Environmental Good Practice – Site Guide (C650)*'

7.2 Avoidance

7.2.1 Footprint of works

The footprint of the works will be limited and works areas will be surrounded by silt fences and sandbags to help prevent water contamination from the proposed bridge works. Appropriate set back distances from the river will be maintained. The main site compound will not be located within 5m of the river and will be located on dry land.

Access to the river for any instream bridge works should be limited to a single access route to minimize the footprint of works. Impacts to the riparian habitats will be kept to a minimum with natural re-vegetation after the completion of works.

Access under the bridge must be provided at all times to allow safe passage along the river channel for wildlife such as Otter.

7.2.2 Timing of works

The proposed works will be undertaken outside of the salmon close season and outside of the river lamprey spawning season (spring/early summer). The salmon close season begins on the 30th of September and therefore works will have to be completed before this time. Works should also be limited



to daylight hours to avoid potential disturbance to nocturnal animals foraging at the subject bridge site, namely Otter. Works should be limited to between 8am and 5pm.

It is also noted that vegetation clearance works must be undertaken outside of the bird nesting season (1st March – 31st August). Bird nests were noted in the bridge structure during the visit in March 2021. If the timing for the works is too narrow, works may proceed in early August provided a site ecologist can confirm that there are no active nest sites in the bridge structure. If no active nests are present, works may commence towards the end of the bird nesting season in August.

7.3 Water Quality Protection

Any oiling or refueling of machinery that may be required will be undertaken away from the watercourse. Any oils or fuels that may be required for minor machinery used during the proposed works will be stored appropriately in bunded tanks in the site compound (which should be fenced off 5m from the river) to ensure no spillages occur. Machinery will be well-maintained and checked for leaks prior to its use on site and prior to working in-stream if required. Spill kits will be used and any leaks on site will be cleaned immediately. The site compound will have security to deter vandalism, theft and unauthorised access.

Any tool washing and waste / grey water from the site will be stored securely until it can be removed from site. There could be impacts from welfare facilities for employees and to mitigate this portaloos should be provided and regularly maintained by a licenced facility and all sewage appropriately removed from the site to an authorised treatment plant.

No concrete / cement mixing will be carried out at the riverbank area; mixing within the mixing area in the site compound will be controlled by the contractor, with all wash water, tool washings and any waste / grey water stored securely and removed; no waste will be stored on site; concrete / cement and grout work must be carried out behind the silt fencing and sandbags, in the dry works area. Precast concrete will be used wherever possible. Storage areas for concrete / cement and grout required for the works will be included in the site compound.

Vegetation to be removed will be kept to a minimum. Biosecurity section below details measures to be undertaken prior to vegetation clearance in relation to invasive species on site. The waste from any vegetation removal will also have to be dealt with appropriately away from the river. The chosen ecologically safe herbicide will be named in the Method Statement and stored safely and appropriately in the site compound. A detailed description of its use will be provided in the Method Statement. When removing vegetation from the bridge ensure no debris from damaged section of the bridge remains in the water. All work carried out on the bridge including raking out joints, flushing them to remove loose material and dust along with the construction of new walls will be carried out such that no debris will enter the river, using a tarp where necessary.

Silt fences will be placed on the outside of the works area first before works commence and before any silt is excavated, with sandbags placed inside to ensure no impacts regarding suspended solids arise. Details of the sandbags, if required, will be included in the method statement. The site ecologist will ensure that any sandbags and silt fences are erected correctly, if required. The works area will be fenced to avoid trampling or disturbance by personnel outside of the works area or by public access to the site.

Prior to any instream works occurring, the site ecologist will agree a 5-day weather window of low flow conditions with the contractor to minimise the risk of works in the river during a flood event. The extent



of instream works with regard to the methodology for damming of the works area is still to be agreed by the contractor in the site specific detailed CEMP, but the mitigations to protect water quality and the integrity of the river corridor remain regardless.

If there is a requirement for pumping out water from the dammed works area silt bags will be installed at the end of the pumping pipes to filter water to be pumped from the dammed section of the river. These silt bags will be specified in the detailed method statement to adequately cope with the volume of water and will be maintained so it is operating effectively with suspended solids loadings at the end of pipe at less than 10 mg/l. Any dewatering must pass through a silt bag, which would be similar in nature to flood water in the area.

7.4 Biosecurity

There is extensive growth of the non-native invasive plant Giant Hogweed *Heracleum mantegazzianum* at the site, in the riparian zone both upstream and downstream of Kileengarriff bridge. This is a highly invasive plant that is spread by seed and easily out-competes native species. Extreme care must be taken at the bridge site in order to effectively control the eradication and eliminate risk of spread of this plant.

Biosecurity measures will follow NRA guidelines 'The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads' (NRA, 2010) and the IFI guidelines 'Biosecurity Protocol for Field Survey Work' (IFI, 2010). The sap of this plant is highly toxic and can have severe and painful blistering of the skin so employees should be aware of the risks and appropriately informed, with setback distances employed wherever possible. This must be incorporated into the Method Statement.

All equipment to be used on site will be steam cleaned before dispatching to site, and all hired equipment will be treated on site with an approved biocide / cleaning agent. A disinfection / cleaning station will be set up next to the site compound and 5m back from the river. Crayfish plague is also known to occur downstream in the River Mulkear. Particular attention will have to be given to sterilizing all equipment / work gear that will come in contact with the river, by using suitable disinfectants such as Virkon aquatic, to ensure no spread of crayfish plague occurs.

The NRA Guidelines detail sections on Giant Hogweed and in particular, its eradication. Full details of control measures are provided in the NRA document. The seeds of Giant Hogweed may remain viable for up to 15 years, which is why eradication is so difficult. Eradication should be the aim, but a minimum aim is to prevent the plant from producing seed. According to the NRA, soil within 4m of established plants are likely to contain vast numbers of seeds, but the majority of seeds are contained within the top 5cm of soil and will only persist for 1-2 years. Care must be taken to not disturb the ground adjacent to the watercourse as seeds can be easily transported by water. The use of tracked machines should be limited in contaminated areas to prevent the transfer of vegetative material and seed-laden soil. On leaving the site, any tracked machinery should be thoroughly cleaned within a designated area to prevent the spread of material. Giant hogweed material and infected soil should be stored on top of a membrane fabric in a designated area for appropriate disposal. On completion of the clearance, this area be subsequently monitored for re-growth during the spring to autumn period and appropriate treatment undertaken as necessary (NRA, 2010).

There are two methods of Giant Hogweed removal, either Physical removal or Chemical removal. Full details of each of these measures is provided in the NRA document, one method must be chosen and included in the method statement for the project. Physical removal requires hand tools and full PPE for personnel, to be undertaken in Spring following recent rain, and follow-up to deal with seedlings for 5



years. Chemical removal either involves Glyphosate or 2,4-D and these are usually foliar sprays, wiper applicators, spot treatment or stem injection (NRA, 2010). Removal methods have to have commenced prior to the construction works.

7.5 Site ecologist

A site ecologist will need to be appointed for the duration of the proposed works. The site ecologist will work with the contractor to draw up the precise site-specific method statement prior to the commencement of works. This method statement will include precise details of the works, accessing areas, equipment / machinery / materials etc. for each stage of the project. This will ensure that the works are carried out following the best practice guidelines and the mitigation measures provided in this document with minimal impacts on the Natura 2000 network. The ecologist will be on site on a regular basis to ensure compliance with the environmental and ecological protection measures specified in the method statement.

A site induction will be carried out by the site ecologist for all contractors' personnel including sub-contractor staff attending the site. The site induction will ensure that any person working on site is aware of the mitigation measures that will be implemented on site. This will include limiting access to within the works area, timing of works, water quality protection measures and biosecurity protocols. This will be the first element of the works undertaken.

The site ecologist will over-see the set-up of dry works areas if any are required for the proposed works. Any Lamprey sp., Salmon or other fish species potentially caught behind the dammed area will be translocated upstream by the ecologist who will have obtained a section 14 license for this activity.

8. RESIDUAL IMPACTS

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. Favourable conservation status is defined for Annex I habitats and Annex II species in the Habitat Directive (1992):

Article 1 (e)

Conservation status of a natural habitat means the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Article 2.

The conservative status of a natural habitat will be taken as 'favourable' when: its natural range and areas it covers within that range are stable or increasing, and the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future.

Article 1 (i)

Conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the territory referred to in Article 2.

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



Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

The Conservation Objectives of the Lower River Shannon SAC are detailed in one site specific report prepared by the National Parks and Wildlife Service (NPWS, 2012). The current assessment utilizes the site-specific conservation objectives and the national 'Status of EU Protected Habitats and Species in Ireland' Report (NPWS, 2019a; NPWS, 2019b; NPWS, 2019c).

Kileengarriff Bridge is located over the 5th order Kileengarriff River in Murroe, Co. Limerick which is a tributary of the River Mulkear. The Kileengarriff 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. Impacts on these Qualifying Interests were identified as water quality, disturbance and invasive species. Water quality impacts could arise from increased suspended solids, contaminants entering the watercourse, spillages of oils / fuels, cement / concrete and / or root herbicide. Dewatering of areas also poses risks to water quality. Disturbance may arise through increased noise and human activity on site. There is extensive growth of the non-native invasive plant Giant Hogweed *Heracleum mantegazzianum* at the site, in the riparian zone both upstream and downstream of Kileengarriff bridge. This could be easily spread further or spread to other areas affecting the Natura 2000 network. Other Invasive species could also be introduced on site through vectors such as machinery or tools / personnel on site. Mitigation provided includes a detailed method statement and CEMP, limiting the footprint and timing of the works, water quality protection measures, biosecurity measures and a site ecologist. No significant impacts are envisaged, and with mitigation, the impacts will be reduced insofar as possible.

The implementation of the provided mitigation measures is considered to be sufficient to minimise any risk of impacts to the SAC to imperceptible in scale. There are no impacts arising from the proposed development which could affect the conservation status of the Annex I habitats or Annex II species listed as qualifying interests of the SAC.

The proposed development will comply with the required mitigation to ensure that there will be no residual impacts arising.



Table 4 Potential Impacts, Mitigation Measures and Residual Impacts for each of the affected Q.I.s.

Qualifying Interest	Impact	Mitigation Measures	Residual Impact
Estuaries	Water quality; invasive species	Detailed Method Statement and CEMP following listed guidelines; limiting the footprint of the works; silt fences and sandbags; site compound not within 5m of river and on dry land; if instream works required access limited to single route; impacts to riparian habitats minimised with natural re-vegetation; any oiling / refuelling away from watercourse; oils / fuels in bunded tanks in site compound; machinery well maintained and checked for leaks; spill kits provided; security at site compound; tool washing / grey water stored securely until removed off site; portaloo provided and regularly maintained by licensed facility; no vegetation debris instream; silt fences on outside of works areas; sand bags placed inside if required; works are fenced off; no concrete / cement mixing at river bank area; precast concrete used where possible; tarp or similar material placed underneath bridge to catch potential debris; no waste stored on site; chosen ecologically safe herbicide named in method statement and stored securely in site compound; site ecologist to agree 5 day weather window of low flow conditions if instream works required; if pumping out water from dewatered area required, silt bags installed at end of pipes; NRA guidelines followed for biosecurity; Strict biosecurity guidelines as well as detailed control measures for eradication of Giant Hogweed on site; sterilise all equipment / work gear that comes into contact with river, all equipment steam cleaned before arriving on site; site ecologist employed; site ecologist to give site induction.	No residual impacts.
Watercourses of Plain to Montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	Water quality; invasive species	As above for Estuaries.	No residual impacts.
Sea lamprey	Water quality; invasive species	Detailed Method Statement and CEMP following listed guidelines; limiting the footprint of the works; silt fences and sandbags; site compound not within 5m of river and on dry land; if instream works required access limited to single route; impacts to riparian habitats minimised with natural re-vegetation; timing of works outside salmon spawning season with works permitted from July-September; any oiling / refuelling away from watercourse; oils / fuels in bunded tanks in site compound; machinery well maintained and checked for leaks; spill kits provided; security at site compound; tool washing / grey water stored securely until removed off site; portaloo provided and regularly maintained by licensed facility; no vegetation debris instream; silt fences on outside of works areas; sand bags placed inside if required; works are fenced off; no concrete / cement mixing at river bank area; precast concrete used where possible; tarp or similar material placed underneath bridge to catch potential debris; no waste stored on site; chosen ecologically safe herbicide named in method statement and stored securely in site compound; site ecologist to agree 5 day weather window of low flow conditions If instream works required; if pumping out water from dewatered area required, silt bags installed at end of pipes; NRA guidelines followed for biosecurity; Strict biosecurity guidelines as well as detailed control measures for eradication of Giant Hogweed on site; sterilise all equipment / work gear that comes into contact with river, all equipment steam cleaned before arriving on site; site ecologist employed; site ecologist to give site induction; site ecologist to oversee set up of dry works areas and any fish species potentially caught will be translocated upstream with section 14 licence by site ecologist.	No residual impacts.



Qualifying Interest	Impact	Mitigation Measures	Residual Impact
Brook lamprey	Water quality; disturbance; invasive species	Detailed Method Statement and CEMP following listed guidelines; limiting the footprint of the works; silt fences and sandbags; site compound not within 5m of river and on dry land; if instream works required access limited to single route; impacts to riparian habitats minimised with natural re-vegetation; timing of works outside salmon spawning season with works permitted from July-September; any oiling / refuelling away from watercourse; oils / fuels in bunded tanks in site compound; machinery well maintained and checked for leaks; spill kits provided; security at site compound; tool washing / grey water stored securely until removed off site; portaloos provided and regularly maintained by licensed facility; no vegetation debris instream; silt fences on outside of works areas; sand bags placed inside if required; works are fenced off; no concrete / cement mixing at river bank area; precast concrete used where possible; tarp or similar material placed underneath bridge to catch potential debris; no waste stored on site; chosen ecologically safe herbicide named in method statement and stored securely in site compound; site ecologist to agree 5 day weather window of low flow conditions If instream works required; if pumping out water from dewatered area required, silt bags installed at end of pipes; NRA guidelines followed for biosecurity; Strict biosecurity guidelines as well as detailed control measures for eradication of Giant Hogweed on site; sterilise all equipment / work gear that comes into contact with river, all equipment steam cleaned before arriving on site; site ecologist employed; site ecologist to give site induction; site ecologist to oversee set up of dry works areas and any fish species potentially caught will be translocated upstream with section 14 licence by site ecologist.	No residual impacts.
River lamprey	Water quality; disturbance; invasive species	As above for Brook lamprey.	No residual impacts.
Salmon	Water quality; disturbance; invasive species	As above for Brook lamprey.	No residual impacts.
Otter	Water quality; disturbance; invasive species	Detailed Method Statement and CEMP following listed guidelines; limiting the footprint of the works; silt fences and sandbags; site compound not within 5m of river and on dry land; if instream works required access limited to single route; impacts to riparian habitats minimised with natural re-vegetation; any oiling / refuelling away from watercourse; oils / fuels in bunded tanks in site compound; machinery well maintained and checked for leaks; spill kits provided; security at site compound; tool washing / grey water stored securely until removed off site; portaloos provided and regularly maintained by licensed facility; no vegetation debris instream; silt fences on outside of works areas; sand bags placed inside if required; works are fenced off; no concrete / cement mixing at river bank area; precast concrete used where possible; tarp or similar material placed underneath bridge to catch potential debris; no waste stored on site; chosen ecologically safe herbicide named in method statement and stored securely in site compound; site ecologist to agree 5 day weather window of low flow conditions If instream works required; if pumping out water from dewatered area required, silt bags installed at end of pipes; NRA guidelines followed for biosecurity; Strict biosecurity guidelines as well as detailed control measures for eradication of Giant Hogweed on site; sterilise all equipment / work gear that comes into contact with river, all equipment steam cleaned before arriving on site; site ecologist employed; site ecologist to give site induction; site ecologist to oversee set up of dry works areas.	No residual impacts.



9. CONCLUSION STATEMENT

The provisions of Article 6 of the 'Habitats' Directive 92/43/EC (2000) defines 'integrity' as the: 'coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or population of species for which the site is or will be classified'.

Mitigation measures proposed ensure that there are no residual impacts on the Lower River Shannon SAC. The potential impacts identified, including water quality, disturbance and invasive species, will be successfully reduced to imperceptible in scale following the implementation of the mitigation measures in this NIS. It has therefore been concluded that following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted impacts from the proposed works, and with the implementation of the mitigation measures proposed, that the proposed works do not pose a risk adversely affecting the integrity of any Natura 2000 site, either alone or in-combination with other plans or projects.



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PLATES



Plate 1 Kileengarriff Bridge during March 2021.



Plate 2 The upstream side of the bridge with Giant Hogweed growth starting in Spring 2021.

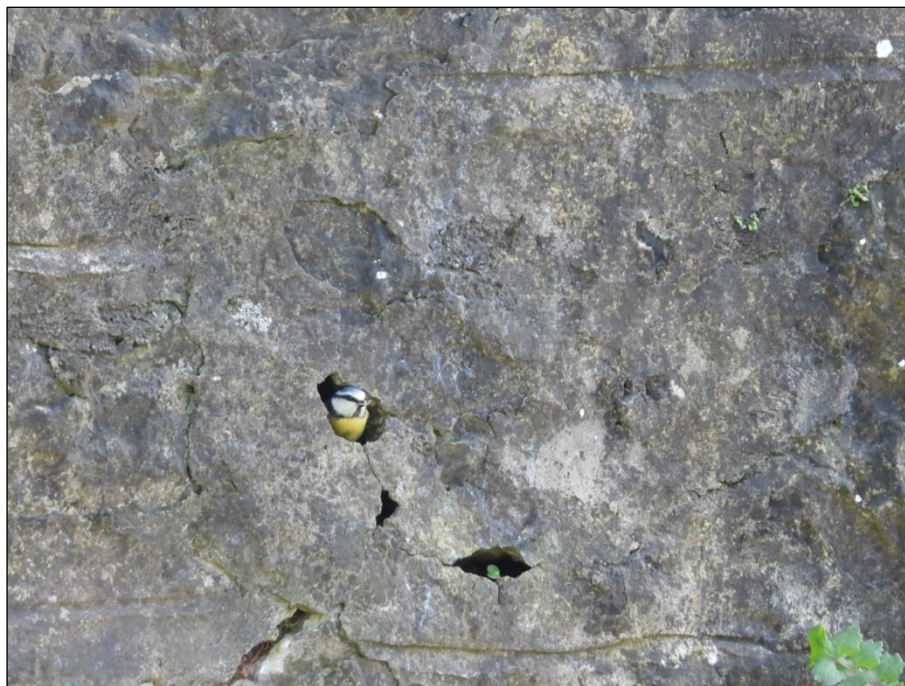


Plate 3 Blue tit was found to be nesting in the bridge during the visit in March 2021.



Plate 4 Giant Hogweed is a non-native invasive species that has largely colonised the riparian area of the bridge site.



Plate 5 The downstream side of the bridge, showing Giant Hogweed again.



Plate 6 Juvenile lamprey habitat is present upstream and downstream of the bridge site.



Plate 7 Juvenile lamprey habitat downstream of the bridge as well as riparian Giant Hogweed growth on both sides of the river.



Plate 8 This site was also visited during winter 2020 and Ivy growth was noted on the bridge structure, which was not present at the time of the visit in March 2021. It is unclear when this was removed.



APPENDIX 1 NPWS SITE SYNOPSIS

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 predominate (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 Glenacarneay. Rivers within the sub-catchment of the Mulkear include the Killeenagarriff, 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 Mague River. To the west of Foynes, a number of small estuaries form indentations in the predominantly hard coastline, namely Poulmasherry 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. Poulmasherry 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. Seminal 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 a 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 *Fontinalis antipyretica* are present 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 there 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 telmateia*) 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 land uses 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 (EclA) 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

Oifigi 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.



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