MKO Planning and Environmental Consultants

Ecological Impact Assessment

Markievicz Bridge Scour Repairs, Sligo

DOCUMENT DETAILS

Client:	**PUNCH Engineering**
Project Title:	**Markievicz Bridge Repairs, Sligo**
Project Number:	**220943**
Document Title:	**Ecological Impact Assessment**
Document File Name:	**EcIA F – 2025.03.27 – 220943**
Prepared By:	**MKO** **Tuam Road** **Galway** **Ireland** **H91 VW84**

Planning and Environmental Consultants

Rev	Status	Date	Author(s)	Approved By
01	D1	2025.03.19	EF	PR
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1. INTRODUCTION

1.1 Background

MKO has been commissioned to conduct an Ecological Impact Assessment (EcIA) of the riverbed and bride masonry scour repairs, as well as the de-vegetation works on the Markievicz bridge in Sligo Town, County Sligo.

The EcIA includes an accurate description of all aspects of the proposed works during construction, operation. It then provides a comprehensive description of the baseline ecological environment, which is based on an appropriate level of survey work that was carried out in accordance with the most appropriate guidelines and methodologies. The EcIA then completes a thorough assessment of the impacts of the Proposed Works on biodiversity. Where likely ecologically significant effects are identified, measures are prescribed to avoid or minimise or compensate for such effects.

1.2 Statement of Authority

A baseline ecological survey was undertaken on 13th of October 2022 by Cillian Burke (BSc. Env.) and Patrick O'Boyle (B.Sc., M.Sc.) of MKO. Bat surveys were carried out on the 17th of September 2024 by David Culleton (B.Sc., M.Sc.), Laura McEntegart (BSc.), Nora Szijarto (B.Sc., M.Sc.) and Cormac Roberts. A second bat survey was carried out on the 1st of October 2024 by Laura McEntegart, Frederick Mosley (B.Sc., M.Sc.), Cuan Feely (BSc.) and Cormac Roberts. A river habitat assessment was carried out on the 13th of March 2025 by Emily Fair (BSc., MSc.) and Aran von der Geest Moroney (BSc.).

This report has been prepared by Cuan Feely and Emily Fair. Cuan is a Graduate Ecologist with MKO. Emily Fair is an Ecologist with MKO who has 4 years' experience with ecological assessment. This report has been reviewed by Pat Roberts (BSc.) who has over 20 years' experience in ecological consultancy and has undertaken numerous assessments covering a wide range of projects including wastewater treatment plants, wind farms, road infrastructure and housing developments.

1.3 Relevant Guidance

In addition, the guidelines listed below were consulted in the preparation of this document to provide the scope, structure and content of the assessment:

- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018)
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022).
- Guidelines for assessment of Ecological Impacts of National Road Schemes, (NRA, 2009).
- CIEEM (2017) Guidelines on Ecological Report Writing. Chartered Institute of Ecology and Environmental Management, Winchester.

2. DESCRIPTION OF PROPOSED WORKS

2.1 Site Location

The Proposed Works is located at the Markievicz Bridge (traditionally known as the 'New Bridge') located at Bridge Street, Sligo Town (Grid Ref: G 69328 35945). The Markievicz bridge spans the Garavogue River, located in the centre of Sligo Town and utilised both by both pedestrians and motorists. The bridge was erected in 1648, and it connects the north and south sides of Sligo across the Garavogue River. The bridge is located within a built urban area, with buildings, footpaths and roads immediately adjoining the bridge on either side of the Garavogue River.

The Proposed Works on the Garavogue River is located within Lough Gill SAC (001976), 240m upstream from Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC (000627) and 700m upstream from Cummeen Strand SPA (004035).

The site location is shown below in Figure 2-1

2.2 Characteristics of the Proposed Works

2.2.1 Need for the Proposed Works

The Markievicz Bridge was built in 1648 and has been an important crossing point through the middle of Sligo Town for both pedestrians and vehicles. Over the years, significant damage has occurred to the bridge as a result of scour damage to the bridge piers.

The channel bed has been eroded in the vicinity of the bridge as a result of contraction scour, causing a significant hydraulic jump at the upstream face of the bridge. The piers have also been undermined to varying degrees as a result of the local scour. The extent of the scour damage has potential to result in a decline in structural integrity of the Markievicz Bridge.

The scour damage can be attributed to the sudden expansion of water as it leaves the confines of the bridge arches. The sudden expansion of water can cause a 'hydraulic jump' as water transitions from high velocity and low depth to low velocity and high depth. The hydraulic jump causes turbulence and an associated large dissipation of energy which has induced scour damage to the riverbed. Once scour holes are formed, the increased turbulence they cause can lead to further scour damage on the riverbed.

Detailed inspections of the Markievicz have determined that the existing vegetation growth is not currently causing structural damage, however if proper routine maintenance is not regularly undertaken, advanced vegetation growth has potential to impact the structural integrity of a structure. Therefore, the removal of the vegetation before it progresses to this stage is in the best interests of the structural condition of the bridge.

The following sections detail the proposed methodologies for repairing the riverbed scour damage, the scour damage to the bridge abutments as well as the de-vegetation works on the exterior of the bridge.

2.2.2 Description of the Project

2.2.2.1 Site Establishment

Access to the existing piers and riverbed will be from the R870 regional road which crosses the Garavogue River via the Markievicz Bridge. Due to the nature of the works, appropriate signage will be

provided at the works areas to alert traffic and pedestrians to the construction activities and related traffic at the works locations.

Temporary traffic lights will be set up on the southern end of Markievicz Bridge, adjacent to the Rockwood Parade and John F. Kennedy Parade. A site compound will be established at the John F. Kennedy Parade which will comprise of temporary car parking, deliveries area, material storage, welfare facilities, and a mobile crane as required.

All repair works will be in accordance with CIRIA C742 Manual on scour at bridges and other hydraulic structures, including supplementary guides, and all in-stream works will follow the IFI (2016) *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.*

2.2.2.2 Dry Working Area Establishment

A dry working area will be established spanning half of the width of the Garavogue River at a time. The total dry working area will be approximately 980m^2 in total and will extend approximately 6m upstream of the bridge and approximately 15.5m downstream of the bridge.

The dry working area will be in place for the duration of the works (approximately 6 months total; approximately 3 months for each half of the proposed works) in order to carry out all of the structural masonry pier scour repairs, the riverbed scour repairs as well as de-vegetation on the bridge masonry surface. Once one section (approximately half of the bridge structure) has been completed, the dry working area will be removed and a new dry working area will be established on the other side of the river, ensuring that water will always be allowed to flow freely around the dry working area.

The following methodology will be used to create the dry working area within the Garavogue River:

- All works will be carried out in accordance with IFI (2016) *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*
- A mobile crane will be set up in the site compound at street level with full access to the works areas and delivery areas.
- The dry working area will span approximately half of the river at any given time.
- Tonne bags filled with clean inert sand will be lowered into the section of the river to be dewatered.
    - The tonne bags will be double stacked and arranged to form the walls of the dewatered area.
    - An impermeable, plastic membrane will be used to seal off the area.
    - Smaller sandbags will also be used to fully seal the inside of the dewatering area from excessive water ingress, and to weigh down the impermeable plastic membrane.
- The area will be electrofished
- A sump will be dug within the proposed dry working area.
- Water will be pumped from inside the dewatering area to pumps located in the site compound area along the south riverbank.
- Dewatering of the dry working area will be carried out by pumping the water out of the sump in the dry working area, through the pump system located within the construction site compound, which will be fitted with a silt buster.
- The pumped water from the dry working area will be pumped through the silt buster into the area confined by a silt curtain within the Garavogue River. The mouth of the return pipe will be located behind the silt curtain within the river.

Once the dry working area has been established and is free form water ingress, the structural masonry pier scour repairs, riverbed scour repairs and the de-vegetation works will commence.

2.2.2.3 Structural Masonry Pier Scour Repairs on the Markievicz Bridge

The proposed repairs on the pier footings of the Markievicz Bridge will be carried out in order to reverse the current and prevent future local scour affecting the structural integrity of the bridge by extending the pier footings further below ground level.

The proposed bridge pier scour repairs will involve the following steps:

- All works will be carried out within the dry working area as outlined in Section 2.2.2.2 above.
- Loose materials will be removed from beneath the masonry piers where the scour damage has occurred within the riverbed. The area will be hand excavated to competent material.
- A concrete letterbox framework will be installed at the edge of the hand-excavated area up to the competent material retained on the masonry pier
- The area within the letterbox framework up to the competent material will be filled with high early strength self-compacting concrete.
- The concrete formwork will then be removed and the concrete letterbox protrusion remaining will be cut off
- The riverbed immediately adjoining the masonry repairs letterbox framework will be repaired and the details can be found below in Section 2.2.2.4.

A drawing of the Structural Masonry Pier Scour Repairs can be found below in Figure 2-2.

2.2.2.4 Riverbed Scour Repairs

The proposed scour repairs on the riverbed beneath the Markievicz Bridge and immediately downstream of the bridge will be carried out in order to reverse the current contraction scour and delay its recurrence by rehabilitating the channel bed in the vicinity of the bridge.

The total works area will be approximately 980m^2, however it should be noted that scour repairs will only be required within a fraction of this total area and will be largely downstream of the bridge within the works area. Scour repairs will only take place in areas of the riverbed that have scoured away creating scour holes. These locations can be seen in Figure 2-4.

Scour damage upstream of the Markievicz Bridge are relatively minor and shallow. This area will require minimal works and will only require re-spreading of the existing riverbed materials where scour damage has occurred. The materials will be re-spread to natural riverbed finish levels. See Figure 2-3 below.

The riverbed scour repairs on the Garavogue River beneath the bridge arches and downstream of the bridge will involve the following steps:

- All works will be carried out within the dry working area as outlined in Section 2.2.2.2 above.
- A 1.5 tonne electric mini digger will be used to infill the existing scour holes on the riverbed.
- A geotextile membrane layer will be placed along the riverbed
- Granular fill material will be used to in-fill the larger scour holes
- Rock rip-rap will be placed on top of the granular material to in-fill the larger scour holes
    - 250mm rock rip-rap will be used
- Where riverbed material has deposited on the riverbed next to scour holes, this material will be re-spread over the rock rip-rap, where possible.
- The riverbed will be finished to natural levels

2.2.2.5 De-vegetation

De-vegetation works will be undertaken while a dry working area is in place within the riverbed. The entire masonry surface area of the bridge will be de-vegetated, cleaned and repointed.

All vegetation will be removed from the surface of the bridge by hand. Steam and/or abrasive cleaning will then be undertaken on the stone masonry of the bridge, followed by extensive mortar joint re-pointing using lime mortar where it is required.

The de-vegetation works will be carried out by fully scaffolding the bridge elevations within the dewatered areas.

Map Legend

- SIte Location
- Markievicz Bridge Boundary
- Extent of dewatered area
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Garavogue River
- WFD Sub-Catchment
- WFD Catchment

Drawing Title

Site Location

Project Title

Markievicz Bridge Scour Repairs

Drawn By	Checked By
EF	SM
Project No.	Drawing No.
220943	Figure 2-1
Scale	Date
1:50,000	04/03/2025

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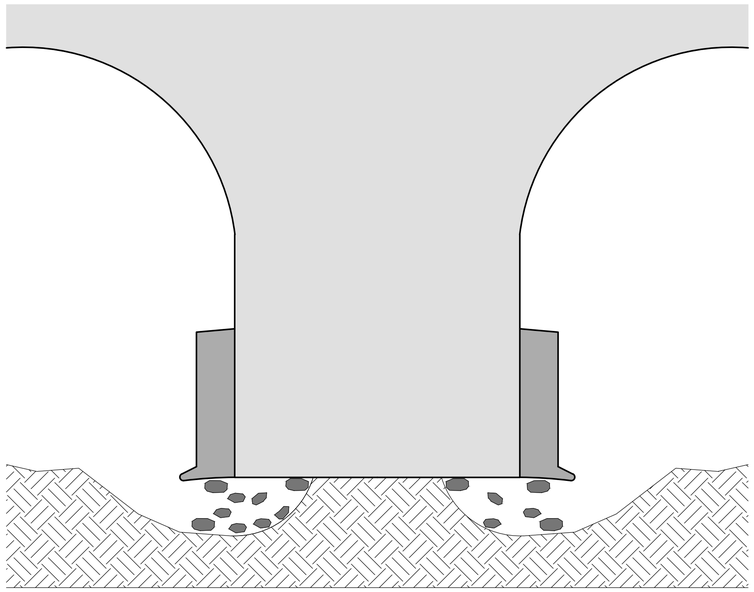
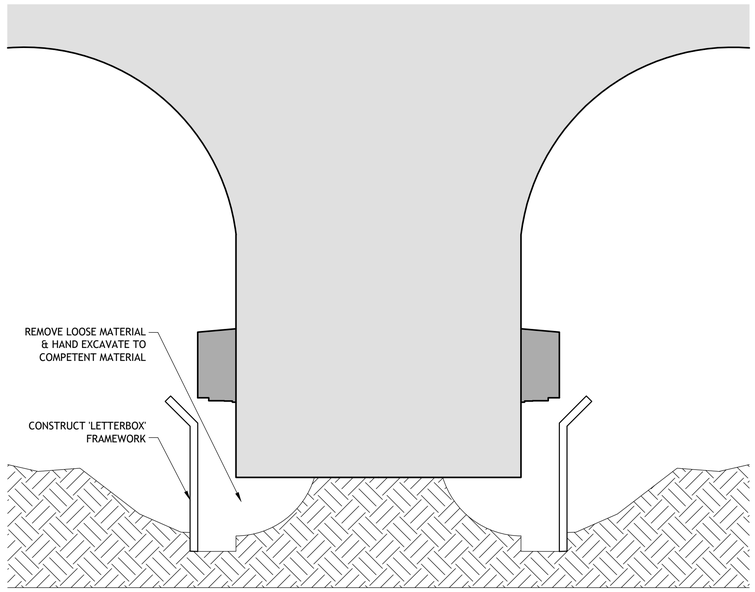
NOTES:
1. ALL DIMENSIONS IN METERS UNLESS NOTED OTHERWISE.
2. DO NOT SCALE FROM THIS DRAWING, USE FIGURED DIMENSIONS ONLY.

LEGEND

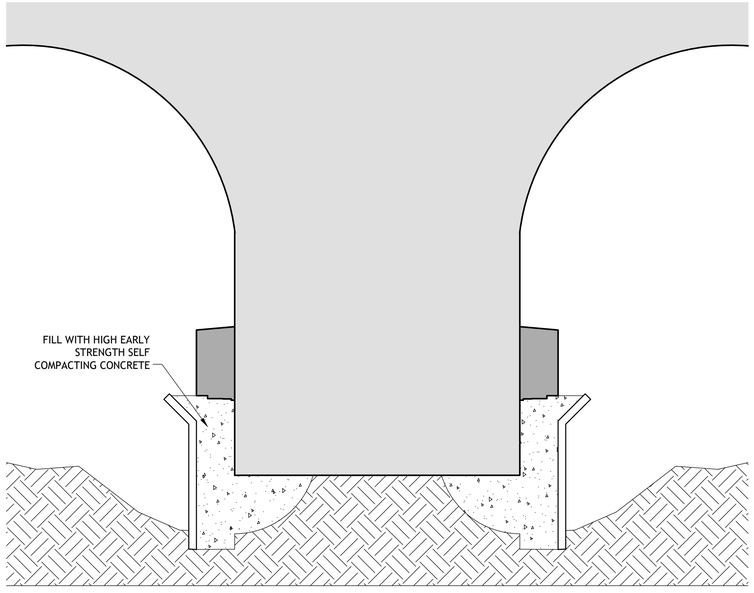
- MASONRY PIER
- CONCRETE SKIRT
- EXTENT OF SCOUR



EXISTING PIER
SCALE 1:20



PROPOSED STEP 1
SCALE 1:20



PROPOSED STEP 2
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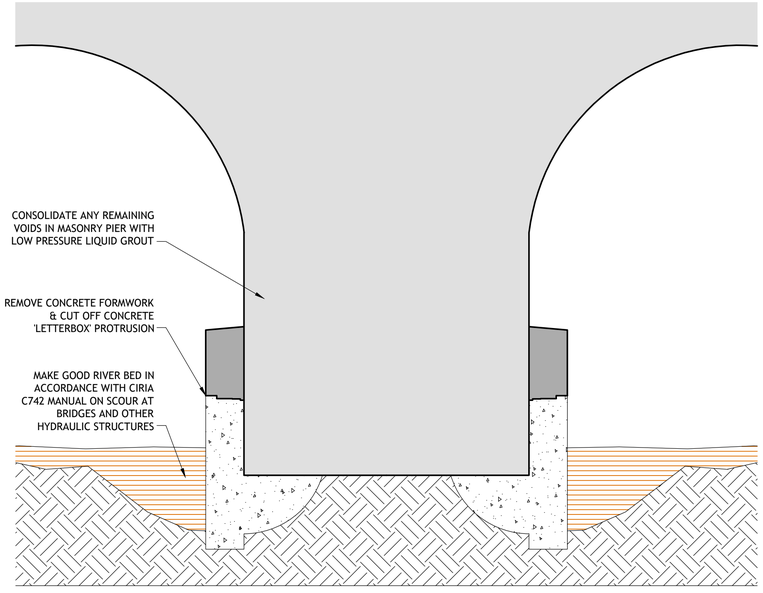

PROPOSED STEP 3
SCALE 1:20

EXISTING PIER LAYOUT
SCALE 1:20

1:100
2m 0 2m 4m 6m 8m 10m

1:20
400mm 0 400mm 800mm 1200mm 1600mm 2000mm

BUILDING INFORMATION MODELLING (BIM) IS EN ISO 19650-2:2018
NSAI Certified

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Client: SLIGO COUNTY COUNCIL

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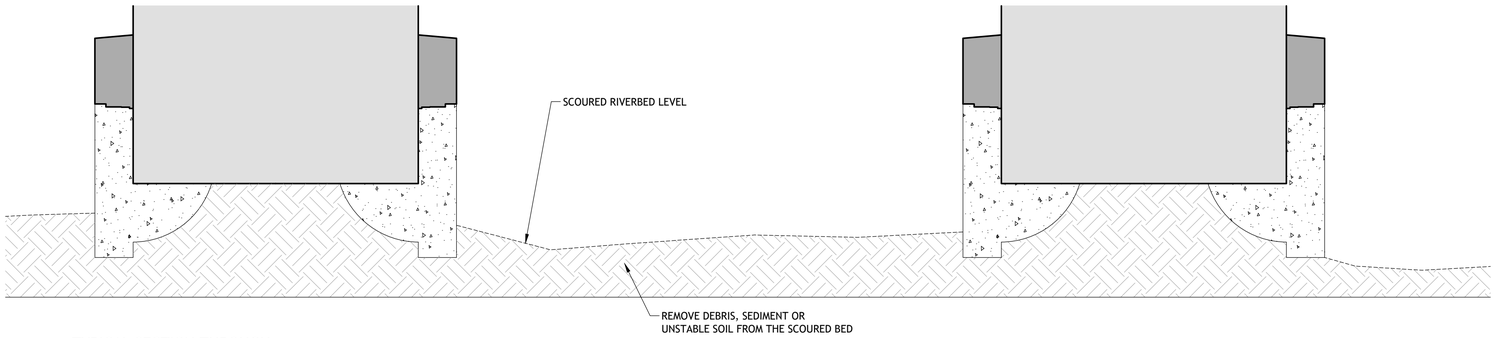
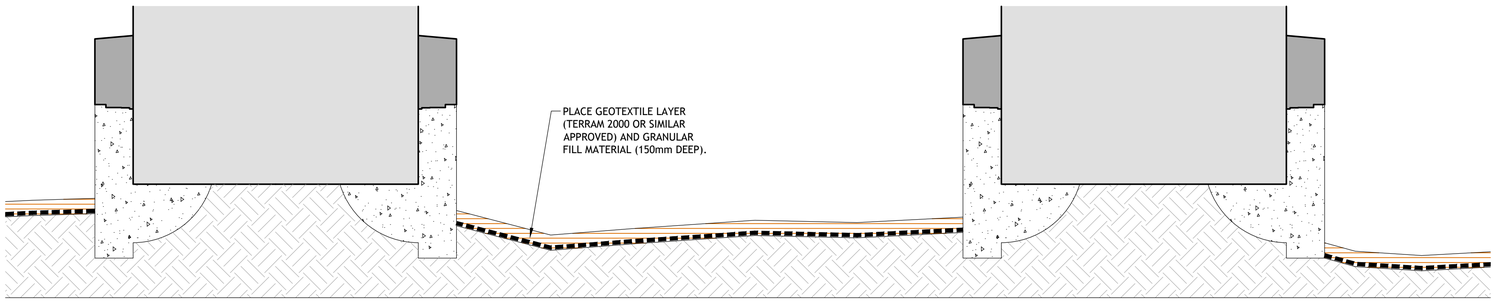
Project: MARKIEVICZ BRIDGE REHABILITATION				
Title: EXISTING STRUCTURAL PIER SCOUR REPAIRS				
Drawn: F McGibbon	Date drawn: NOVEMBER 2024	Technician Check: PJ Mulcahy	Engineer Check: Kevin D O'Riordan	Approved: Kevin D O'Riordan
Project No: 224138	Model Ref: 224138-PUNCH-XX-XX-M2-C-0201		Drawing Status: A0 (Planning)	
Scale @ A1: AS SHOWN	Document No: 224138-PUNCH-XX-XX-DR-C-0201			Revision No: C01



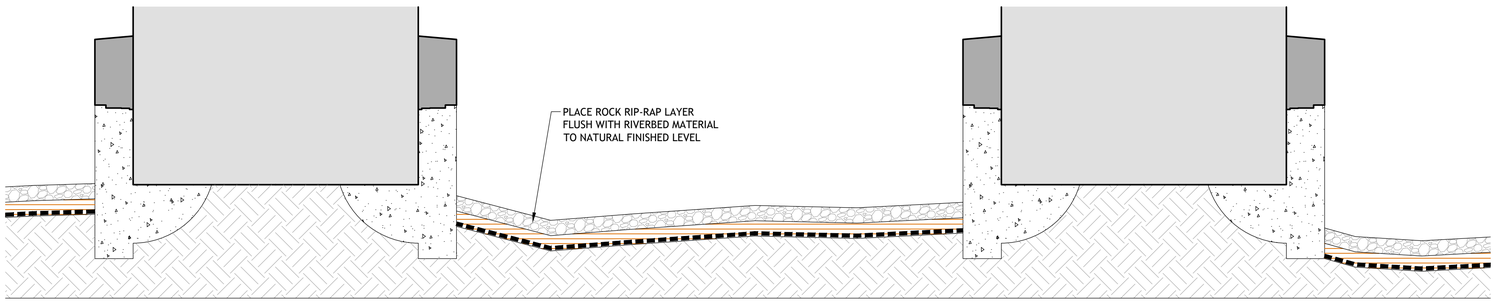
TYPICAL SECTION THROUGH
RIVERBED SCOUR REPAIR WORKS
- PROPOSED STEP 1

SCALE 1:20



TYPICAL SECTION THROUGH
RIVERBED SCOUR REPAIR WORKS
- PROPOSED STEP 2

SCALE 1:20



TYPICAL SECTION THROUGH
RIVERBED SCOUR REPAIR WORKS
- PROPOSED STEP 3

SCALE 1:20

REQUIREMENTS FOR BEDDING GRAVEL	
GRADINGS	d50 = 50mm
SHAPE	≤ 3.0
PROPORTION OF CRUSHED OR BROKEN SURFACES	≤ 50%
PARTICLE DENSITY	2.5
PLASTICITY INDEX	NON PLASTIC
LOS ANGELES COEFFICIENT	LA ≤ 35% (PER IS EN 1097-2)
SLAKE DURABILITY	> 90%
RESISTANCE TO WEAR	60 TO 80%

REQUIREMENTS FOR ROCK ARMOUR	
GRADINGS	d50 = 250mm
SHAPE	≤ 2.5
PROPORTION OF CRUSHED OR BROKEN SURFACES	90%
PARTICLE DENSITY	2.5
PLASTICITY INDEX	NON PLASTIC
LOS ANGELES COEFFICIENT	LA ≤ 35% (PER IS EN 1097-2)
SLAKE DURABILITY	>90%
RESISTANCE TO WEAR	60 TO 80%

NOTES:

1. ALL DIMENSIONS IN METERS UNLESS NOTED OTHERWISE.
2. DO NOT SCALE FROM THIS DRAWING, USE FIGURED DIMENSIONS ONLY.
3. USE NON-WOVEN GEOTEXTILE WITH A MINIMUM TENSILE STRENGTH OF [X] kN/m AND PERMEABILITY OF [Y] M/S.
4. OVERLAP ADJACENT GEOTEXTILE SHEETS BY A MINIMUM OF 0.5M AND SECURE IN PLACE BEFORE PLACING THE GRANULAR LAYER.
5. GEOTEXTILE SHALL BE TERRAM 2000 OR SIMILAR APPROVED.
6. THE GEOTEXTILE FABRIC SHALL BE PLACED DIRECTLY ON THE PREPARED RIVERBED, FREE OF DEBRIS AND SHARP OBJECTS.
7. GRANULAR FILL MATERIAL TO BE PLACED ON THE GEOTEXTILE IN A LAYER 150MM DEEP.
8. THE GRANULAR FILL LAYER SHALL BE PLACED EVENLY OVER THE GEOTEXTILE TO PREVENT PUNCTURING AND PROVIDE A STABLE BEDDING FOR THE RIPRAP.
9. GRANULAR FILL MATERIAL TO MEET SPECIFICATION REQUIREMENTS SHOWN IN BOX 1.
10. RIPRAP SHALL BE LAID ONTO OF THE GRANDULAR FILL MATERIAL TO A DEPTH MATCHING THE SURROUNDING RIVER BED LEVELS.
11. RIPRAP TO MEET SPECIFICATION REQUIREMENTS SHOWN IN BOX 2.
12. RIPRAP SHALL BE PLACED GRADUALLY, AVOIDING FREE FALL TO PREVENT DAMAGE TO UNDERLYING LAYERS
13. SCOUR HOLES LESS THAN 400MM DEEP TO BE FILLED WITH GRANULAR FILL MATERIAL ONLY. SURROUNDING GRAVEL MATERIAL WITHIN THE RIVERBED CAN BE USED WHERE POSSIBLE.

BUILDING INFORMATION MODELLING (BIM)
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NSAI Certified

Rev	Amendment	By	Date
C01	ISSUED FOR PLANNING	CS	2025-04-01

Client: SLIGO COUNTY COUNCIL

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Project: MARKIEVICZ BRIDGE REHABILITATION				
Title: RIVERBED SCOUR REPAIRS				
Drawn: F McGibbon	Date drawn: NOVEMBER 2024	Technician Check: PJ Mulcahy	Engineer Check: Kevin D O'Riordan	Approved: Kevin D O'Riordan
Project No: 224138	Model Ref: 224138-PUNCH-XX-XX-M2-C-0202		Drawing Status: A0 (Planning)	
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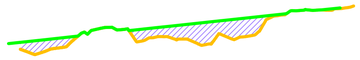
NOTES:
1. ALL DIMENSIONS IN METERS UNLESS NOTED OTHERWISE.
2. DO NOT SCALE FROM THIS DRAWING, USE FIGURED DIMENSIONS ONLY.

LEGEND:

DENOTES EXTENT OF FILL MATERIAL

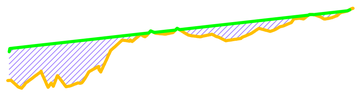
DENOTES BRIDGE PIER / ABUTMENT

FILL LEGEND				
MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR	AREA	VOLUME
0.00	0.20		262.241m2	67.184m3
0.20	0.40		138.524m2	30.165m3
0.40	0.60		56.842m2	11.536m3
0.60	0.80		27.575m2	3.012m3
0.80	1.00		4.287m2	0.198m3



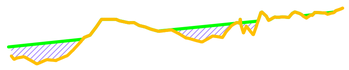
Proposed Levels	1.539	1.754	1.869	2.152
Existing Levels		1.697	1.675	2.152
Chainage	00.000	10.000	20.000	28.154

SECTION A



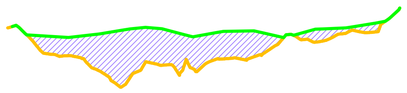
Proposed Levels	1.459	1.678	1.901	2.115
Existing Levels	0.935	1.594	1.721	2.115
Chainage	00.000	10.000	20.000	28.179

SECTION B



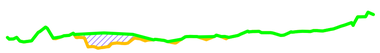
Proposed Levels	1.418	1.815	1.834	2.051
Existing Levels	1.272	1.815	1.632	2.051
Chainage	00.000	10.000	20.000	27.263

SECTION C



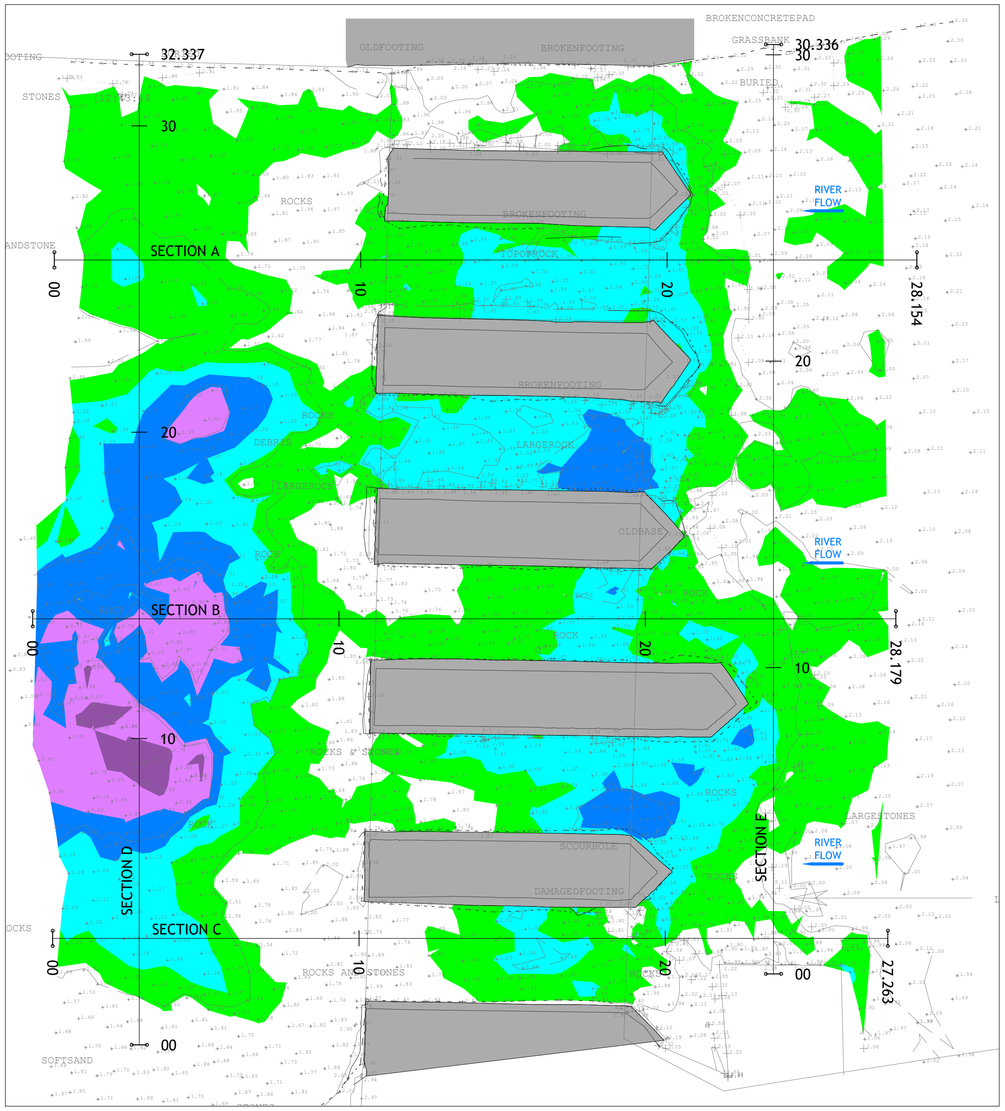
Proposed Levels	1.616	1.600	1.567	1.694	1.940
Existing Levels	1.616	0.809	1.137	1.550	1.940
Chainage	00.000	10.000	20.000	30.000	32.337

SECTION D



Proposed Levels	1.929	2.054	2.092	2.388
Existing Levels	1.929	1.901	2.092	2.388
Chainage	00.000	10.000	20.000	30.336

SECTION E



RIVERBED SCOUR LAYOUT
SCALE 1:100

1:100
2m 0 2m 4m 6m 8m 10m

1:250
5m 0 5m 10m 15m 20m 25m

Tailte Éireann Licence No. CYAL50378050
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BUILDING INFORMATION MODELLING (BIM) I.S EN ISO 19650-2:2018 NSAI Certified

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C01	ISSUED FOR PLANNING	CS	2025-04-01

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Project: MARKIEVICZ BRIDGE REHABILITATION				
Title: RIVERBED SCOUR REPAIR SECTIONS				
Drawn: F McGibbon	Date drawn: NOVEMBER 2024	Technician Check:	Engineer Check: Kevin D O'Riordan	Approved: Kevin D O'Riordan
Project No: 224138	Model Ref: 224138-PUNCH-XX-XX-M2-C-0203		Drawing Status: A0 (Planning)	
Scale @ A1: AS SHOWN	Document No: 224138-PUNCH-XX-XX-DR-C-0203			Revision No: C01

3. METHODOLOGY

The following sections describe the methodologies followed to establish the baseline ecological condition of the Proposed Works site and surrounding area. Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to and at the time of the project proceeding. Ecological Baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

3.1 Desk Study Methodology

A desk study was undertaken to inform this ecological impact assessment. This study includes a thorough review of available information that is relevant to the ecology of the site of the Proposed Works. This information provides valuable existing data and also helps in the assessing the requirement for additional ecological surveys.

The following list describes the sources of data consulted:

- Review of online web-mappers: National Parks and Wildlife Service (NPWS), Environmental Protection Agency (EPA)
- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper
- Review of NPWS Article 17 Metadata and GIS Database Files
- Review of available online Inland Fisheries Ireland (IFI) Data.

3.1.1 Bat Desktop Review

A desktop review of published material was undertaken to inform all subsequent field studies and assessments. The aim of the desktop review was to identify the presence of species of interest within the site and surrounding region.

The following list describes the sources of data consulted:

- Review of online web-mappers: National Parks and Wildlife Service (NPWS) mapping.
- Review of NPWS Article 17 Report.
- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper.
- Sligo County Development Plan 2024-2030.
- Bat Conservation Ireland (BCI) Database.
- Review of NPWS Lesser Horseshoe Bat national dataset.

3.2 Scoping and Consultation

MKO and PUNCH Consulting Engineering undertook a scoping exercise during the preparation of this report. The recommendations of the consultees have informed the contents of this EcIA. The table below provides a review of all responses with regards to biodiversity during the scoping process.

Table 3-1 Organizations consulted with regard to biodiversity

Consultee	Response Date	Response
Inland Fisheries Ireland (IFI)	20/09/2023	The primary concern raised by IFI is in relation to the spread of pollutant materials, biosecurity and the in-stream works. IFI highlighted that the Proposed Works area is located on the Garavogue River, which provides spawning habitat for salmon, trout

		and lamprey. The habitat is very sensitive to pollution such as silt. The Garvogue River is already under environmental pressure and salmon stocks have declined below their conservation limit, that is the number of adult salmon returning to spawn required for a sustainable fishery. IFI also mentions that all in-stream works must comply with the 2016 in-stream works guidelines, and that consultation with IFI must take place prior to works commencing. Robust methodology for creating a dry working area and silt control methods must be in place before works commencing on site. There must be no spread of invasive species or pathogens such as cray fish plague as a result of the works. All equipment and machinery used must be cleaned, and the IFI biosecurity protocol should be used as reference.
Development Applications Unit (DAU) Department of Housing, Local Government and Heritage	11/02/2025	Markievicz Bridge is over the Garavogue River, which connects Lough Gill SAC [001976] and Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC [000627], and is designated for its length. As such the proposed works need to be fully described and have an Appropriate Assessment carried out. In relation to European Sites, an AA determination must contain complete, precise and definitive findings and conclusions with regard to the implications of a proposal for the conservation objectives and integrity of a European site. There is known Bat Activity around the bridge. As part of the study for these works, suitable bat surveys should be carried out on the bridge and any relevant parts of the river walls for the use of the bridge by roosting bats. A description of the Artificial Lighting in the area of the Bridge should be assessed and recommendations made for light reduction and dark sky standards for enhancement of habitat for fish, bats and other wildlife.

3.3 Ecological Survey Methodology

3.3.1 Multi-disciplinary Ecological Walkover Surveys

Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to and at the time of the project proceeding. Ecological Baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

The multi-disciplinary walkover surveys comprehensively covered the entire study area for features and locations of ecological significance. The survey was carried out in accordance with NRA *Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna* on National Road Schemes (NRA, 2009).

Habitats were identified in accordance with the Heritage Council's 'Guide to Habitats in Ireland' (Fossitt, 2000). Plant nomenclature for vascular plants follows 'New Flora of the British Isles' (Stace, 2010), while mosses and liverworts nomenclature follows 'Mosses and Liverworts of Britain and Ireland - a field guide' (British Bryological Society, 2010).

Surveys were carried out on the 13th of October 2022, 17th of September 2024, 1st of October 2024 and the 12th of March 2025. The survey area covered the Markievicz Bridge itself in addition to the habitats in its immediate vicinity. An otter survey was undertaken along the Garavogue Riverbanks both upstream and downstream of the Proposed Works.

3.3.2 Invasive Species

During the multi-disciplinary walkover surveys, a search for non-native invasive species was undertaken within the Site. The survey focused on the identification of invasive species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (As Amended) (S.I. 477 of 2015).

3.3.3 Otter Surveys

Otter surveys were conducted as per NRA (2009) guidelines. This involved a search for all otter signs e.g. spraints, scat, prints, slides, trails, couches and holts. In addition to the width of the rivers/ watercourses, a 10m riparian buffer (both banks) was considered to comprise part of the otter habitat (NPWS, 2009). The dedicated otter survey also followed the guidance as set out in NRA (2008) 'Guidelines for the Treatment of Otters Prior to the Construction of National Roads Schemes' and following CIEEM best practice competencies for species surveys (CIEEM, 2012). Otter surveys were undertaken along the banks of the Garavogue River within 150m both upstream and downstream of the Proposed Works.

3.3.4 Aquatic Baseline Surveys

Aquatic Baseline Surveys were undertaken on the 13th of March 2025 by Aran von der Geest Moroney (B.Sc.) and Emily Fait (BSc., MSc.). The specific surveys carried out are detailed below.

3.3.4.1 Riverbed Habitat Assessment

An aquatic habitat assessment was undertaken along the Garavogue River on the 13th of March 2025 within the immediate proximity of the Proposed Works, focussing on the proposed working area within the riverbed, in order to determine the riverine habitat types present within and in the vicinity of the Proposed Works. The survey design and methodologies were derived from current ecological best practice guidance documents. Habitats were classified in accordance with the national habitat classification system used in Ireland - A Guide to Habitats in Ireland (Fossitt, 2000)

The site was assessed in terms of the following variables:

- Physical waterbody characteristics (e.g., channel width depth)
- Any historic or current hydromorphological channel or bank modifications
- Bank profiles, including bank height and composition
- Substrate type, listing substrate fractions in order of dominance
- Flow type, by proportion of pool, riffle and glide
- In-stream macrophyte and aquatic bryophytes occurring and the prominence of each (DAFOR scale)
- Water clarity and colouration
- Riparian vegetation composition

The survey was devised to gather ecological baseline information including any habitat features that could potentially support protected Qualifying Interest species associated with EU designated sites within the wider area, namely Lough Gill SAC, with a focus on Lamprey species (*Lamperta spp., Petromyzon spp.)* and Salmon (*Salmo salar*), as well as all other aquatic fauna that may be present within the river. In addition, the survey had regard to the potential presence of problematic invasive alien species with an emphasis on those species listed on the 'Third Schedule' of Regulations 49 & 50 of the Birds and Natural Habitats Regulations 2011. The assessments have regard to the NRA guidance document - Guidelines on management of noxious weeds and non-native invasive plant species on national roads. National Roads Authority (NRA, 2010).

During the site visit, any additional information on other species within the site was recorded, as relevant, in order to provide a complete baseline understanding of the Proposed Works area.

3.3.4.2 Fisheries Habitat Assessment

An assessment/appraisal of the riverine habitats was undertaken to determine the potential for watercourses within and in the vicinity of the Site to support fish species including salmonids, lamprey spp. and European eel among other fish species likely to utilise the watercourses within the study area.

Fisheries habitat assessments were conducted utilising elements of the following methodologies and literature to characterise the watercourse:

- Environment Agency's 'River Habitat Survey in Britain and Ireland Field Survey Guidance Manual 2003' (EA, 2003)
- Irish Heritage Council's 'A Guide to Habitats in Ireland' (Fossitt, 2000).
- 'Channels & Challenges. Enhancing Salmonid Rivers'. Irish Freshwater Fisheries Ecology & Management Series (O'Grady, 2006)
- 'Ecology of the Atlantic Salmon' (Hendry & Cragg-Hine, 2003)
- Life Cycle Unit method (Kennedy, 1984; O'Connor & Kennedy, 2002)
- 'Ecology of the River, Brook, and Sea Lamprey' (Maitland, 2003)
- NPWS Irish Wildlife Manuals lamprey surveys (O'Connor, 2004; O'Connor, 2006; and O'Connor, 2007)

3.3.4.3 Biosecurity Measures

Biosecurity measures which were implemented followed IFI Biosecurity Protocol for Field Survey Work, (IFI, 2010). Due to increasingly prevalent spread of crayfish plague in Ireland and to prevent the spread of aquatic invasive species all equipment was scrubbed and cleaned prior to and post works with Virkon Aquatic. Additionally, all equipment was cleaned with Virkon Aquatic between survey sites to minimise the potential for the spread of invasives between watercourses/ survey sites. Any instance of invasive species recorded was recorded and conveyed to IFI.

3.3.5 Bat Surveys

3.3.5.1 Bat Habitat Appraisal

The landscape features on the site were visually assessed for potential use as bat roosting habitats and commuting/foraging habitats using a protocol set out in BCT Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2023). Table 4.1 of the guidelines identifies a grading protocol for assessing structures, trees and commuting/foraging habitat for bats. The protocol is divided into four Suitability Categories: High, Moderate, Low, Negligible and None.

A walkover survey of the Study Area was carried out during daylight hours on the 17th of September 2024. The landscape features on the site were visually assessed for potential use as bat roosting habitats and commuting/foraging habitats using a protocol set out in BCT *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (4th edn.) (Collins, 2023). The aim of the survey was to determine the presence of roosting bats within the proposed site.

3.3.5.2 Preliminary Roost Assessment

A search for roosts was undertaken within the boundary of the Proposed Works site by three licenced ecologists to identify any potential roost features (PRFs).

The underside of the bridge was inspected from the bank with the aid of torches, a thermal camera and binoculars, for its potential to support roosting bats and searched for potential access points into the structure.

3.3.5.3 Bat Activity Surveys

3.3.5.3.1 *Dusk Emergence Surveys*

The bridge was subject to dusk emergence surveys on the 17th of September and the 1st October 2024. The two dusk emergence survey were carried out by four surveyors at Markievicz Bridge. Manual activity surveys included roost surveys of the bridge. For each of the surveys, surveyors were equipped with active full spectrum bat detectors, Batlogger M (Elekon AG, Lucerne, Switzerland). Surveys commenced 15 minutes before sunset and continued until two hours after sunset. Where possible, species identification was made in the field and any other relevant information was also noted, e.g., numbers, behaviour, features used.

The bridge was identified during the bat habitat appraisal as having potential to host roosting bats was subject to presence/absence surveys in the form of emergence surveys. Rationale for survey effort was based on guidelines proposed by Collins in Tables 7.1 and 7.2 (Collins, 2023). Surveyors were located at various locations around the structure (Locations 1, 2, 3 and 4) with a focus on potential access point and roosting features identified during the daylight walkover surveys. The purpose was to identify any bat species, numbers, access points and roosting locations within each the PRF structure. Night vision aids (NVAs), including a thermal camera, aided the survey effort.

3.4 Methodology for Assessment of Impacts and Effects

3.4.1 Identification of Target Receptors and Key Ecological Receptors

The criteria used to assess the ecological value and significance of the Proposed Works for habitats and species present follows Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA 2009) and Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018).

3.4.2 Determining Importance of Ecological Receptors

The importance of the ecological features identified within the study area was determined with reference to a defined geographical context. This was undertaken following a methodology that is set out in Chapter 3 of the 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (NRA, 2009). These guidelines set out the context for the determination of value on a geographic basis with a hierarchy assigned in relation to the importance of any particular receptor. The guidelines provide a basis for determination of whether any particular receptor is of importance on the following scales:

- International
- National
- County
- Local Importance (Higher Value)
- Local Importance (Lower Value)

The Guidelines clearly set out the criteria by which each geographic level of importance can be assigned. Locally Important (lower value) receptors contain habitats and species that are widespread and of low ecological significance and of any importance only in the local area. Internationally Important sites are either designated for conservation as part of the Natura 2000 Network (SAC or SPA) or provide the best examples of habitats or internationally important populations of protected flora and fauna. Specific criteria for assigning each of the other levels of importance are set out in the guidelines and have been followed in this assessment. Where appropriate, the geographic frame of reference set out above was adapted to suit local circumstances. In addition, and where appropriate, the conservation status of habitats and species is considered when determining the significance of ecological receptors.

Any ecological receptors that are determined to be of Local Importance (Higher Value), County, National or International importance following the criteria set out in NRA (2009) are considered to be Key Ecological Receptors (KERs) for the purposes of ecological impact assessment if there is a pathway for effects thereon. Any receptors that are determined to be of Local Importance (Lower Value) are not considered to be Key Ecological Receptors.

3.4.3 Characterisation of Impacts and Effects

The Proposed Works will result in a number of impacts. The ecological effects of these impacts are characterised as per the CIEEM 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (2018). The headings under which the impacts are characterised follow those listed in the guidance document and are applied where relevant. A summary of the impact characteristics considered in the assessment is provided below:

- **Positive or Negative.** Assessment of whether the Proposed Works result in a positive or negative effect on the ecological receptor.
- **Extent.** Description of the spatial area over which the effect has the potential to occur.
- **Magnitude** to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.
- **Duration** is defined in relation to ecological characteristics (such as the lifecycle of a species) as well as human timeframes. For example, five years, which might seem short-term in the human context or that of other long-lived species, would span at least five generations of some invertebrate species.
- **Frequency and Timing**. This relates to the number of times that an impact occurs and its frequency. A small-scale impact can have a significant effect if it is repeated on numerous occasions over a long period.
- **Reversibility.** This is a consideration of whether an effect is reversible within a 'reasonable' timescale. What is considered to be a reasonable timescale can vary between receptors and is justified where appropriate in the impact assessment section of this report.

3.4.4 Determining the Significance of Effects

The ecological significance of the effects of the Proposed Works are determined following the precautionary principle and in accordance with the methodology set out in Section 5 of CIEEM (2018).

For the purpose of Ecological Impact Assessment (EcIA), 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g., for a designated site) or broad (e.g., national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local (CIEEM, 2018).

When determining significance, consideration is given to whether:

- Any processes or key characteristics of key ecological receptors will be removed or changed.
- There will be an effect on the nature, extent, structure and function of important ecological features.
- There is an effect on the average population size and viability of ecologically important species.
- There is an effect on the conservation status of important ecological habitats and species.

3.4.5 Limitations

Seasonal factors that affect distribution patterns and habits of species were taken into account when conducting the surveys. The potential of the Site to support certain populations (in particular those of conservation importance that may not have been recorded during the field survey due to their seasonal absence or nocturnal/cryptic habits) was assessed.

The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines. The habitats and species on the Site were readily identifiable and comprehensive assessments were made during the field visit. No limitations in respect of the surveys undertaken have been identified.

4. DESK STUDY

4.1 Designated Sites

The potential for the Proposed Works to impact on sites that are designated for nature conservation was considered in this Ecological Impact Assessment.

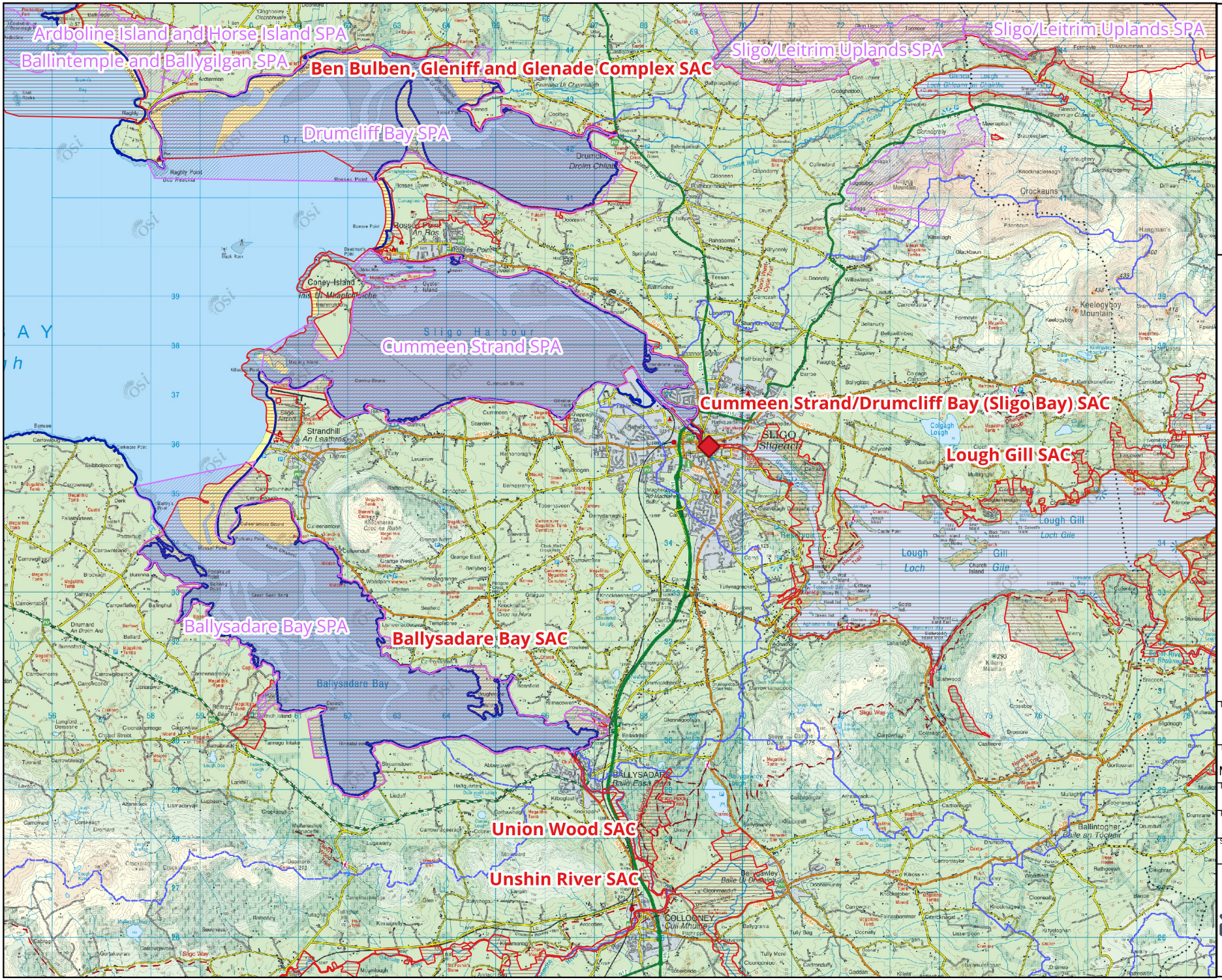
Special Areas of Conservation (SACs) and Special Protection Areas for Birds (SPAs) are designated under EU Habitats Directive and are collectively known as 'European Sites'. The potential for effects on European Sites is fully considered in the AA Screening Report/Natura Impact Statement. The location of the site of the Proposed Works in relation to European Sites is provided in Figure 4-1.

Natural Heritage Areas (NHAs) are designated under the Wildlife (Amendment) Act 2000 and their management and protection is provided by this legislation and planning policy. The potential for effects on these designated sites is fully considered in this EcIA.

Proposed Natural Heritage Areas (pNHAs) were designated on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, the potential for effects on these designated sites is fully considered in this EcIA.

The following methodology was used to establish which European and nationally designated sites have the potential to be impacted by the Proposed Works:

- Initially the most up to date GIS spatial datasets for European designated sites and water catchments were downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie). The datasets were utilized to identify Designated Sites which could feasibly be affected by the Proposed Works.
- A map of all the European Sites is provided in Figure 4-1. All other designated sites are shown in Figure 4-2.
- Catchment mapping was used to establish or discount potential hydrological connectivity between the site of the Proposed Works and any Designated Sites. The hydrological catchments are also shown in Figures 4-1 and 4-2.
- The potential for likely significant effect on European Designated Sites is fully assessed in the accompanying NIS.
- Table 4-1 provides details of all Nationally Designated Sites as identified in the preceding steps and assesses which are within the likely Zone of Influence.
- The site synopses and conservation objectives of these sites, as per the NPWS website (www.npws.ie), were consulted and reviewed at the time of preparing this report.
- Where potential pathways for Significant Effect are identified, the site is included within the Likely Zone of Influence and further assessment is required.


Ardboline Island and Horse Island SPA
Ballintemple and Ballygilgan SPA
Ben Bulben, Gleniff and Glenade Complex SAC
Sligo/Leitrim Uplands SPA
Sligo/Leitrim Uplands SPA
Drumcliff Bay SPA
Cummeen Strand SPA
Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC
Lough Gill SAC
Ballysadare Bay SPA
Ballysadare Bay SAC
Union Wood SAC
Unshin River SAC
Map Legend
SIte Location
Special Protection Area (SAC)
Special Area of Conservation (SAC)
WFD Sub-Catchment
WFD Catchment
Microsoft product screen shots reprinted with permission from Microsoft Corporation
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Drawing Title
EU Designated Sites
Project Title
Markievicz Bridge Scour Repairs
Drawn By
EF
Checked By
SM
Project No.
220943
Drawing No.
Figure 4-1
Scale
1:100,000
Date
04/03/2025
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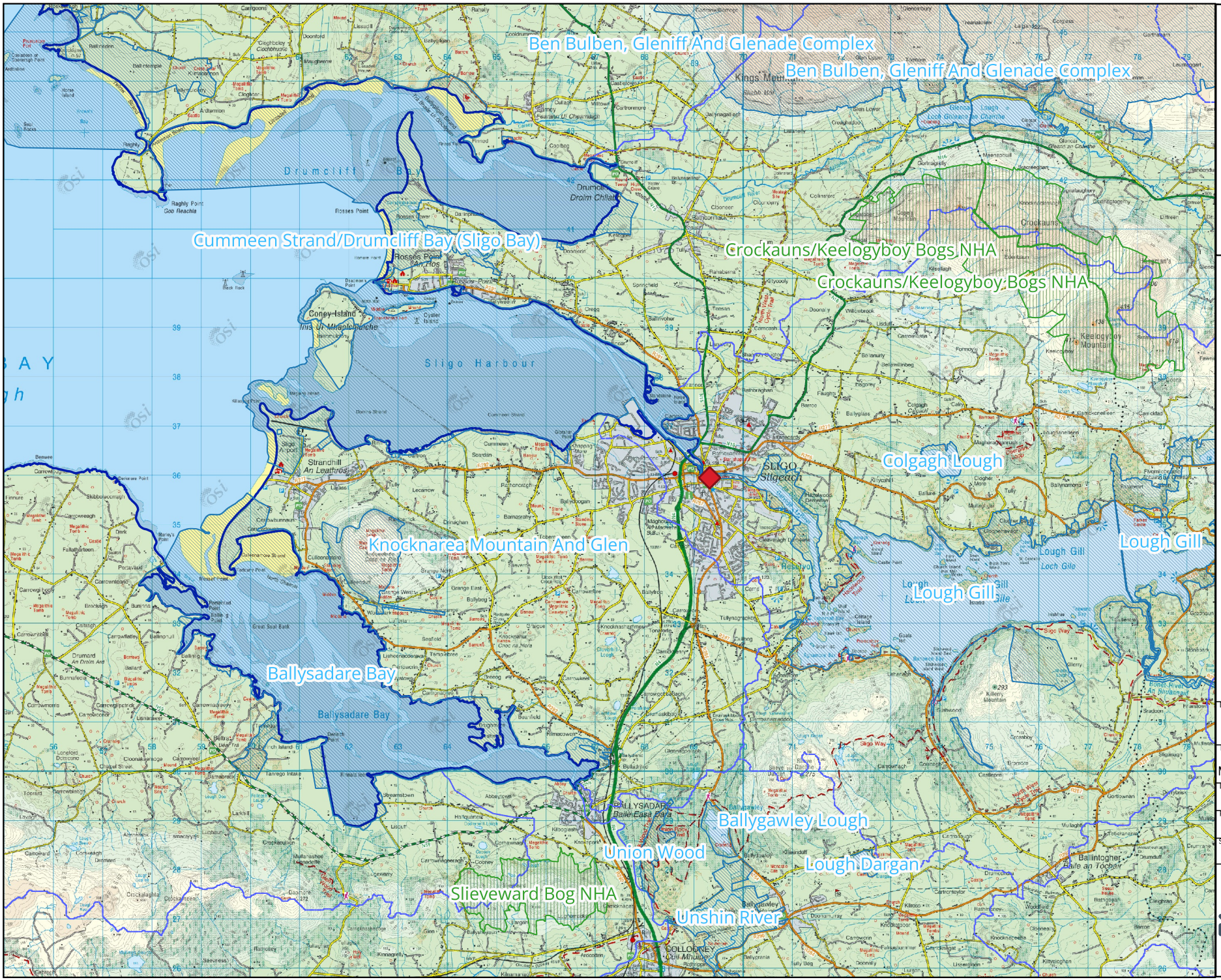

Map Legend

- SIte Location
- Proposed Natural Heritage Area (pNHA)
- Natural Heritage Area (NHA)
- WFD Sub-Catchment
- WFD Catchment

Drawing Title: Nationally Designated Sites

Project Title: Markievicz Bridge Scour Repairs

Drawn By	Checked By
EF	SM
Project No.	**Drawing No.**
220943	Figure 4-2
Scale	**Date**
1:100,000	04/03/2025

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Table 4-1 Identification of Nationally Designated sites within zone of influence

Designated Sites and distance from proposed works	Zone of Influence Determination
Natural Heritage Areas (NHA)	
Crockauns/Keelogyboy Bogs NHA [002435] **Distance:** 5.6km	There will be no direct effects on this NHA as the Proposed Works is located entirely outside of the designated site. There is no existing surface water hydrological connectivity between the Proposed Works and this NHA. This NHA is designated for peatland habitats. The southeast portion of the NHA and the Proposed Works are located within the same groundwater body (Carrowmore East (IE_WE_G_0042)). However, none of the proposed works will require excavations or works which will encounter groundwater, therefore there will be no significant effects on groundwater as a result of the Proposed Works. Due to the significant intervening overland distance (approx. 5.6km), the lack of any hydrological connectivity and the scale of the works confined within the Garravogue River, there will be no significant effects on this NHA. Therefore, no further assessment is required.
Slieveward Bog NHA [001902] **Distance:** 8.1km	There will be no direct effects on this NHA as the Proposed Works is located entirely outside of the designated site. There is no existing surface water hydrological connectivity between the Proposed Works and this NHA. This NHA is designated for peatland habitats. The southeast portion of the NHA and the Proposed Works are located within the same groundwater body (Carrowmore East (IE_WE_G_0042)). However, none of the proposed works will require excavations or works which will encounter groundwater, therefore there will be no significant effects on groundwater as a result of the Proposed Works. Due to the significant intervening overland distance (approx. 8.1km), the lack of any hydrological connectivity and the scale of the works confined within the Garravogue River, there will be no significant effects on this NHA.

Designated Sites and distance from proposed works	Zone of Influence Determination
	Therefore, no further assessment is required.
Proposed Natural Heritage Areas (pNHA)	
Lough Gill pNHA [001976] **Distance:** The Proposed Works and all associated works are located within this pNHA *Overlaps with Lough Gill SAC [001976]*	The Proposed Works and all associated works on the Markievicz Bridge are located entirely within the pNHA boundaries. Therefore, there is potential for direct effects associated with the Proposed Works. A potential for indirect effect on the designated habitats and species was identified via a deterioration of water quality during the construction phase of the Proposed Works. Additionally, there is potential for indirect disturbance effects on the protected species during the construction phase of the Proposed Works as a result of the works occurring directly within the river. There is also potential that the dry working area created within the Garvogue River may result in a barrier to migration of protected species within the river. Therefore, there is an indirect source-pathway-receptor chain for significant effect via disturbance. Further assessment is therefore required. **The pNHA is considered to be *within* the Zone of Influence and further assessment is required.**
Cummeen Strand/Drumcliff Bay (Sligo Bay) pNHA [000627] **Distance:** 190m **Hydrological distance:** 240m	There will be no direct effects on this pNHA as the Proposed Works is located entirely outside of the designated site. A potential for indirect effect on the designated habitats and species has been identified in the form of a deterioration of downstream water quality during the construction phase of the Proposed Works, via a pollution event associated with the instream works. Such an event could occur during the steam cleaning and use of lime mortar associated with the de-vegetation works and the use of concrete associated with the riverbed and bridge abutment repair works. Therefore, there is an indirect source-pathway-receptor chain for significant effect via downstream water quality deterioration. Further assessment is therefore required.

Designated Sites and distance from proposed works	Zone of Influence Determination
Overlaps with Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC [000627] and Cummeen Strand SPA [004035]	**The pNHA is considered to be *within* the Zone of Influence and further assessment is required.**
Colgagh Lough pNHA [001658] **Distance:** 4.3km	There will be no direct effects on this pNHA as the Proposed Works is located entirely outside of the designated site. There is no existing surface water hydrological connectivity between the Proposed Works and this pNHA. The pNHA and the Proposed Works exist within the same ground waterbody, Carrowmore East (IE_WE_G_0042) and sub-catchment (Bonet_SC_030). However, none of the proposed works will require excavations or works which will encounter groundwater. Therefore, there will be no significant effects on groundwater as a result of the Proposed Works. Due to the intervening overland distance (approx. 4.3km), the lack of any hydrological connectivity and the scale of the works confined within the Garravogue River, there will be no significant effects on this pNHA. Therefore, no further assessment is required.
Knocknarea Mountain And Glen pNHA [001670] **Distance:** 6km	There will be no direct effects on this pNHA as the Proposed Works is located entirely outside of the designated site. There is no existing surface water hydrological connectivity between the Proposed Works and this pNHA. Due to the intervening overland distance (approx. 6km), the lack of any hydrological connectivity and the scale of the works confined within the Garravogue River, there will be no significant effects on this pNHA. Therefore, no further assessment is required.
Ballysadare Bay pNHA [000622]	There will be no direct effects on this pNHA as the Proposed Works is located entirely outside of the designated site.

Designated Sites and distance from proposed works	Zone of Influence Determination
Distance: 5.9km *Overlaps with Ballysadare Bay SAC [000622] and Ballysadare Bay SPA [004129]*	There is no direct surface water hydrological connectivity from the Proposed Works to this pNHA. The Garavogue River is hydrologically connected downstream to the Garavogue Estuary. Due to the scale of the Proposed Works confined within the Garavogue River, coupled with the large assimilation capacity of the downstream marine waters and the large intervening overland distance from the Proposed Works to this SAC (approx. 5.9km), there is no potential for significant effects on the designated habitats and species as a result of the Proposed Works. Therefore, no further assessment is required.
Union Wood pNHA [000638] **Distance:** 6.6km *Overlaps with Union Wood SAC [000638]*	There will be no direct effects on this pNHA as the Proposed Works is located entirely outside of the designated site. The habitat for which the site is designated for is terrestrial in nature. There is significant overland distance between the Proposed Works and this pNHA (approx. 6.6km). Therefore, there is no source-pathway-receptor chain for significant effects as a result of the Proposed Works. Therefore, there will be no significant effects on the pNHA as a result of the Proposed Works.
Ballygawley Lough pNHA [001909] **Distance**: 6.6km	There will be no direct effects on this pNHA as the Proposed Works is located entirely outside of the designated site. There is no hydrological connectivity between the pNHA and the Proposed Works. Due to the intervening overland distance (approx. 6.6km), the lack of any hydrological connectivity and the scale of the works confined within the Garravogue River, there will be no significant effects on this pNHA. Therefore, no further assessment is required.
Ben Bulben, Gleniff and Glenade Complex pNHA [000623] **Distance:** 7.3km	There will be no direct effects on this pNHA as the Proposed Works is located entirely outside of the designated site. There is no hydrological connectivity between the pNHA and the Proposed Works.

Designated Sites and distance from proposed works	Zone of Influence Determination
Overlaps with Ben Bulben, Gleniff and Glenade Complex SAC [000623] and Sligo/Leitrim Uplands SPA [004187]	Due to the intervening overland distance (approx. 7.3km), the lack of any hydrological connectivity and the scale of the works confined within the Garravogue River, there will be no significant effects on this pNHA. Therefore, no further assessment is required.
Unshin River pNHA [001898] **Distance:** 7.8km *Overlaps with part of the Unshin River SAC [001898]*	There will be no direct effects on this pNHA as the Proposed Works is located entirely outside of the designated site. There is no existing hydrological connectivity from the Proposed Works to this pNHA. The pNHA flows into the Ballysadare Bay, which is downstream of the Proposed Works. Due to the intervening overland distance (approx. 7.8km), the lack of any hydrological connectivity and the scale of the works confined within the Garravogue River, there will be no significant effects on this pNHA. Therefore, no further assessment is required.
Knockmullin Fen pNHA [001904] **Distance:** 11.2km	There will be no direct effects on this pNHA as the Proposed Works is located entirely outside of the designated site. There is no existing surface water hydrological connectivity between the Proposed Works and this pNHA. The Proposed Works is located within a different groundwater body (Carrowmore East (IE_WE_G_0042)) than this pNHA (Ballygawley (IE_WE_G_0039) and Lavagh-Ballintougher (IE_WE_G_0038) groundwater bodies). Therefore, there will be no significant effects on groundwater as a result of the Proposed Works. Due to the significant intervening overland distance (approx. 11.2km), the lack of any surface or groundwater hydrological connectivity, coupled with the scale of the works confined within the Garravogue River, there will be no significant effects on this pNHA. Therefore, no further assessment is required.

4.2 Vascular Plants

A search was made in the New Atlas of the British & Irish Flora (Preston et al, 2002) to investigate whether any rare or unusual plant species listed under Annex II of the EU Habitats Directive, The Irish Red Data Book, 1, Vascular Plants (Curtis, 1988) or the Flora (Protection) Order (FPO) 2022 had been recorded in the relevant 10km squares in which the Proposed Works is situated (G63). Additionally, the Flora (Protection) Order 2022 Map Viewer [1] was checked within the relevant hectad (G63).

The results of the search are included in Table 4-2.

Table 4-2 records of species listed under the Flora Protection order 2022 Map Viewer (G63)

Common Name	Scientific Name	Status
Round-leaved Wintergreen	*Pyrola rotundifolia* subsp. *maritima*	Red List (NT)

4.3 Bryophytes

A search of the NPWS online data map for bryophytes (NPWS 2018a) was also undertaken. There is one record of the critically endangered Dark Ditrichum *(Ditrichum lineare)* recorded approximately 700m east of the Proposed Works in 1929[2], however this species has not been recorded within the areas since.

4.4 Biodiversity Ireland Database

The National Biodiversity Data centre database was used to search for previous records of protected flora and fauna and invasive species. Table 4-3 and Table 4-4 lists the protected faunal species recorded within the hectad G63 and which pertains to the current study area. Table 4-5 lists the third schedule invasive species recorded within the hectad.

Table 4-3 NBDC records for protected faunal records within hectad G63 (exc. Birds)

Common Name	Scientific Name	Status
Mammals		
Eurasian Badger	*Meles meles*	WA
Eurasian Pygmy Shrew	*Sorex minutus*	WA
Eurasian Red Squirrel	*Sciurus vulgaris*	WA
European Otter	*Lutra lutra*	WA, Annex II, IV
Pine Marten	*Martes martes*	WA, Annex V
Irish Stoat	*Mustela erminea subsp. Hibernica*	WA

[1] *Available at: https://heritagedata.maps.arcgis.com/apps/webappviewer/index.html?id=a41ef4e10227499d8de17a8abe42bd1e*
[2] *Recorded by C.A. cooper during BBS Monitoring in 1929, as per Lockhart, N., Hodgetts, N. & Holyoak, D. (2012). Rare and Threatened Bryophytes of Ireland: National Museums Northern Ireland Publication No. 028.*

Irish Hare	*Lepus timidus subsp. Hibernicus*	WA, Annex V
West European Hedgehog	*Erinaceus europaeus*	WA
Atlantic White-sided Dolphin	*Lagenorhynchus acutus*	WA, Annex IV
Bottle-nosed Dolphin	*Tursiops truncatus*	WA, Annex II, IV
Common Dolphin	*Delphinus delphis*	WA, Annex IV
Common Porpoise	*Phocoena phocoena*	WA, Annex II, IV
Common Seal	*Phoca vitulina*	WA, Annex II, V
Cuvier's Beaked Whale	*Ziphius cavirostris*	WA, Annex IV
Gervais's Beaked Whale	*Mesoplodon europaeus*	WA, Annex IV
Grey Seal	*Halichoerus grypus*	WA, Annex II, V
Long-finned Pilot Whale	*Globicephala melas*	WA, Annex IV
Risso's Dolphin	*Grampus griseus*	WA, Annex IV
Sperm Whale	*Physeter macrocephalus*	WA, Annex IV
Striped Dolphin	*Stenella coeruleoalba*	WA, Annex IV
True's Beaked Whale	*Mesoplodon mirus*	WA, Annex IV
White-beaked Dolphin	*Lagenorhynchus albirostris*	WA, Annex IV
Fish, Amphibians and Reptiles		
Common Frog	*Rana temporaria*	WA, Annex V
Smooth Newt	*Lissotriton vulgaris*	WA
Common Lizard	*Zootoca vivipara*	WA
Sea Lamprey	*Petromyzon marinus*	Annex II
Invertebrates		
Narrow-mouthed Whorl Snail	*Vertigo (Vertilla) angustior*	WA, Annex II
Marsh Fritillary	*Euphydryas aurinia*	Annex II
Bats		
Common Pipistrelle	*Pipistrellus pipistrellus*	WA, Annex IV
Soprano Pipistrelle	*Pipistrellus pygmaeus*	WA, Annex IV

Daubenton's Bat	*Myotis daubentoniid*	WA, Annex IV
Lesser Noctule	*Nyctalus leisleri*	WA, Annex IV
Natterer's Bat	*Myotis nattereri*	WA, Annex IV
Brown Long-eared Bat	*Plecotus auritus*	WA, Annex IV

Table 4-4 NBDC records of Birds within the hectad G63

Birds		
Common Name	**Scientific Name**	**Status**
Barn Swallow	*Hirundo rustica*	BoCCI Amber List
Black Guillemot	*Cepphus grylle*	
Black-headed Gull	*Larus ridibundus*	
Brent Goose	*Branta bernicla*	
Coot	*Fulica atra*	
Linnet	*Linaria cannabina*	
Shelduck	*Tadorna tadorna*	
Starling	*Sturnus vulgaris*	
Teal	*Anas crecca*	
Tree Sparrow	*Passer montanus*	
Wigeon	*Mareca penelope*	
Shag	*Gulosus aristotelis*	
Gadwall	*Mareca strepera*	
Goldcrest	*Regulus regulus*	
Goosander	*Mergus merganser*	
Cormorant	*Phalacrocorax carbo*	
Great-crested Grebe	*Podiceps cristatus*	
Herring Gull	*Larus argentatus*	
House Martin	*Delichon urbicum*	
House Sparrow	*Passer domesticus*	

Lesser Black-backed Gull	*Larus fuscus*	
Mallard	*Anas playtrhynchos*	
Common Gull	*Larus canus*	
Mute Swan	*Cygnus olor*	
Pintail	*Anas acuta*	
Northern Wheatear	*Oenanthe oenanthe*	
Red-breasted Merganser	*Mergus serrator*	
Ringed Plover	*Charadrius hiaticula*	
Turnstone	*Arenaria interpres*	
Sand Martin	*Riparia riparia*	
Skylark	*Alauda arvensis*	
Spotted Flycatcher	*Muscicapa striata*	
Tufted Duck	*Aythya fuligula*	
Willow Warbler	*Phylloscopus trochilus*	
Barn Owl	*Tyto alba*	BoCCI Red List
Kittiwake	*Rissa tridactyla*	
Eider	*Somateria mollissima*	
Goldeneye	*Bucephala clangula*	
Kestrel	*Falco tinnunculus*	
Pochard	*Aythya farina*	
Redshank	*Tringa totanus*	
Snipe	*Gallinago gallinago*	
Swift	*Apus apus*	
Curlew	*Numenius arquata*	
Oystercatcher	*Haematopus ostralegus*	
Woodcock	*Scolopax rusticola*	
Scaup	*Aythya marila*	

Grey Plover	*Pluvialis squatarola*	
Long-tailed Duck	*Clangula hyemalis*	
Lapwing	*Vanellus vanellus*	
Shoveler	*Anas clypeata*	
Red Grouse	*Lagopus lagopus*	
Knot	*Calidris canutus*	
Redwing	*Turdus iliacus*	
Twite	*Linaria flavirostris*	
Velvet Scoter	*Melanitta fusca*	
Yellowhammer	*Emberiza citrinella*	
Arctic Tern	*Sterna paradisaea*	Annex I, BoCCI Amber List
Kingfisher	*Alcedo atthis*	
Common Tern	*Sterna hirundo*	
Great Northern Diver	*Gavia immer*	
Hen Harrier	*Circus cyaneus*	
Little Gull	*Larus minutus*	
Mediterranean Gull	*Larus melanocephalus*	
Merlin	*Falco columbarius*	
Chough	*Pyrrhocorax pyrrhocorax*	
Red-throated Diver	*Gavia stellata*	
Ruff	*Philomachus pugnax*	
Whooper Swan	*Cygnus cygnus*	
Bar-tailed Godwit	*Limosa lapponica*	Annex I, BoCCI Red List
Corncrake	*Crex crex*	
Dunlin	*Calidris alpina*	
Golden Plover	*Pluvialis apricaria*	
Slavonian Grebe	*Podiceps auritus*	

White-tailed Eagle	*Haliaeetus albicilla*	
Little Egret	*Egretta garzetta*	Annex I
Peregrine Falcon	*Falco peregrinus*	

Annex II, Annex IV, Annex V – Of EU Habitats Directive, Annex I – Of EU Birds Directive, WA – Irish Wildlife Acts (1976-2017), BoCCI – Birds of Conservation Concern Ireland

Table 4-5 NBDC records of third schedule invasive species records within hectad G63.

Common Name	Scientific Name
Wireweed	*Sargassum muticum*
Canadian Waterweed	*Elodea canadensis*
Giant Hogweed	*Heracleum mantegazzianum*
Indian Balsam	*Impatiens glandulifera*
Japanese Knotweed	*Fallopia japonica*
Rhododendron	*Rhododendron ponticum*
Spanish Bluebell	*Hyacinthoides hispanica*
Zebra Mussel	*Dreissena polymorpha*
American Mink	*Mustela vison*
Brown Rat	*Rattus norvegicus*

4.5 Review of NPWS Article 17 GIS Datasets

The most recent National Parks and Wildlife Service data on the recorded distribution of EU Habitats Directive Annex I listed habitats was reviewed in relation to the subject lands. This data is available in the form of the NPWS (2019) Article 17 reporting, and associated GIS data, on 'The Status of EU Protected Habitats and Species in Ireland' (NPWS, 2019).

No previously mapped Article 17 habitats are located with the proposed site boundary. There are five Article 17 Annex I habitats located hydrologically connected to the Proposed Works. The Article 17 habitats located within the vicinity of the Proposed Works include:

- [1130] Estuaries - located approx. 250m downstream of the Proposed Works.
- [1140] Tidal mudflats and sandflats - located approx. 410m downstream of the Proposed Works.
- [1410] Mediterranean salt meadows – located approx. 690m north of the Proposed Works.
- [1330] Atlantic salt meadows - located approx. 730m downstream of the Proposed Works.
- [1160] Large shallow inlets and bays – located approx. 5.8km downstream of the Proposed Works.

4.6 Water

4.6.1 EPA Water Quality Data

The baseline hydrology of the site and the surrounding area has been reviewed on the EPA map viewer (https://gis.epa.ie/EPAMaps/). With respect to regional hydrology, the Proposed Works is located within the Bonet_SC_030 WFD sub-catchment and the Sligo Bay (35) WFD catchment. The Markievicz Bridge is located on the Garavogue River (Garavogue_010), which forms part of Lough Gill SAC [001976]. The Garavogue Estuary (IE_WE_470_0100) is located 230m downstream of the Proposed Works.

The Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC [000627] is located within the Garavogue Estuary, which begins approximately 240m downstream of the Proposed Works. The Cummeen Strand SPA [004035] is also located within the Garavogue Estuary, 700m surface water distance downstream of the Proposed Works.

The 3rd cycle river waterbody risk for the Garavogue River is recorded as 'At Risk'. Under the River Waterbody WFD Status 2016-2021, the Garavogue River is recorded as 'Poor'. The 3rd cycle transitional Waterbody risk for the Garavogue Estuary is recorded as 'Under Review'. Under the Transitional Waterbody WFD Status 2016-2021, the estuary is recorded as 'Moderate'. The Carrowmore East groundwater body WFD 3rd cycle risk is recorded as 'At Risk' and the groundwater body WFD Status 2016-2021 is recorded as 'good'.

The Proposed Works is not located within or hydrologically connected to any *Margaritifera* Sensitive Areas. The closest *Margaritifera* Sensitive Area is the Moy Catchment located 20km to the southwest of the Proposed Works.

One Q-value was recorded immediately upstream of the Proposed Works. No Q-Values have been recorded downstream of the Works. The details of these Q values are located in Table 4-6 below.

Table 4-6 Garavogue_010 WFD Waterbody Status Attributes

Water body: Garavogue River (Garavogue_010)	
River Waterbody Code	IE_WE_35G010200
Protected Area	Yes
WFD Risk (3rd Cycle)	At Risk
WFD Status (2016-2021)	Poor
Sub-catchment	Bonet_SC_030
Pressures	Forestry, Urban Run-off
Q-Values	
187m upstream (Sligo: The Mall [Station code: RS35G010200])	Q3, Poor (2021)

4.6.2 Garavogue River - NPWS Data

The Garavogue is a relatively short river of 2km in length, and flows from Lough Gill through Sligo town into Sligo Bay (Garavogue Estruary). The Garavogue River system begins in Glenade Valley, from where the Bonet River flows south, through the Dartry Mountains before flowing into Lough Gill near Dromahair. It then flows out of the western end of Lough Gill and through Sligo Town before flowing to sea through Sligo Harbour (within the Garavogue Estruary), past Coney Island and into Sligo Bay. The Garavogue Estuary (Sligo Bay - IE_WE_470_0000), located approximately 230m downstream of the Proposed Works, is a designated as a shellfish area.

As mentioned in Section 4.6.1 above, the Garavogue River which flows through the Proposed Works is located within Lough Gill SAC [001976]. This SAC is designated for a number of terrestrial habitats fringing Lough Gill itself, as well as the aquatic habitat [3150] Natural Eutrophic Lakes recorded, which is recorded within Lough Gill. This SAC is also designated for a number of mobile aquatic species including [1092] White-clawed Crayfish *(Austropotamobius pallipes),* [1095] Sea Lamprey (*Petromyzon marinus*), [1096] Brook Lamprey (*Lampetra planeri*), [1099] River Lamprey (*Lampetra fluviatilis),* [1106] Atlantic Salmon (*Salmo salar)* [1355] and Otter *(Lutra lutra).*

White-clawed Crayfish has been recorded within the Bonet River, which is approximately 17km upstream of the Proposed Works. According to the SSCO document for this SAC[3], the Garavogue River within Sligo Town is likely utilised by the designated Lamprey and Salmon species for spawning and/or migration.

The Cummeen Strand/Drumcliff Bat (Sligo Bay) SAC [000627] is located approximately 240m downstream of the Proposed Works. This SAC is also designated for a number of aquatic species including 1095] Sea Lamprey (*Petromyzon marinus*) and [1099] River Lamprey (*Lampetra fluviatilis),* as well as [1365] Harbour Seal *(Phoca vitulina).* The Cummeen Strand SPA [004035] is also located downstream of the Proposed Works, via approximately 700m surface water distance. It is designated for the SCI species [A046] Brent Goose Branta (*bernicla hrota),* [A130] Oystercatcher (*Haematopus ostralegus),* [A162] Redshank (*Tringa tetanus)* as well as the supporting aquatic habitat [A999] Wetlands.

4.6.2.1 Tidal Data

The Garavogue river is tidally influenced, and the EPA operates a hydrometric gauge on the Garavogue River, called the *New Bridge Gauge No. 35012* to provide outflow information from Lough Gill (Grid Ref: G 69396 35963). The station is located in Sligo town approximately 50m upstream of the Markievicz bridge. It should be noted that there is a weir with sluice gates 300m upstream of the station, which are operated on a regular basis to control the water levels of Lough Gill. As a result, this can cause spikes in the hydrograph. The station can also be tidal at spring tides. The Marine Institute also operate a tidal gauge 'Sligo', located within Sligo Bay (Grid Ref: G 62172 40269), over 8km downstream of the proposed Works.

4.6.3 Inland Fisheries Ireland (IFI)

There is no Inland Fisheries Ireland (IFI) survey data specific to the stretches of the Garavogue River where the Proposed Works is located. The Proposed Works and Lough Gill SAC are both located within the Sligo Bay WFD Catchment (35) and the Bonet_SC_030 WFD Sub-catchment. Lough Gill is located approximately 3.9km upstream of the Proposed Works, and this lake was surveyed for three years (2008, 2011 and 2017). Data on the Bonet River, upstream of Lough Gill, as well as the Garavogue Estruary, approximately 230m downstream of the Proposed Works, is also provided below.

[3] *NPWS (2021) Conservation Objectives: Lough Gill SAC 001976. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.*

4.6.3.1 Lough Gill

Lough Gill is a large lake, with a surface area of 1,401ha and a maximum depth of 31m. Lough Gill is located approximately 3.9km upstream from the Proposed Works. According to the IFI '*Fish Stock Survey of Lough Gill, July 2017', t*he lake was surveyed on three sperate occasions during the years 2008, 2011 and 2017. The three surveys recorded a total of nine fish species and one hybrid within the lake. Species recorded include Perch (*Perca fluviatilis*), Roach (*Rutilus rutilus*), Bream (*Abramis brama*), Brown Trout (*Salmo truta*), Pike (*Esox Lucius),* European Eel (*Anguilla anguila*), Salmon (*Salmo salar*), Flounder (*Platichthys flesus*), Stone Loach (*Platichthys flesus*) and Roach x Bream (*Rutilus rutilus* x *Abramis brama*). Perch (*Perca fluviatilis*) and Roach (*Rutilus rutilus*) were the most common fish species within Lough Gill on all three of the surveys.

4.6.3.2 Bonet River

The Bonet River flows into the southeastern end of Lough Gill and is located upstream of the Proposed Works though Lough Gill. This river has been surveyed over a two year period (2010 and 2015). The survey locations were located 14.2km upstream from the Proposed Works. Species recorded during these surveys include Brown trout (*Salmo truta*), European Eel (*Anguilla anguila*), Gudgeon (*Gobio gobio*), Lamprey spp. (*Lampetra* spp.), Minnow (*Phoxinus Phoxinus*), Perch (*Perca fluviatilis*), Salmon (*Salmo salar*), Stone Loach (*Barbatula barbatula*) and Three-spined Stickleback (*Gasterosteus aculeatus*).

4.6.3.3 Garavogue Estuary

Garavogue Estuary is located 230m downstream from the Proposed Works. The estuary drains almost completely at low tide leaving a small narrow channel and is strongly influenced by the marine environment. It covers an area of 8.82km^2. The substrate is dominated by soft mud and extensive mud flats are present at low tide. Eleven species were recorded during the surveys for the estuary which were carried out in 2008. Species recorded during the survey include Flounder (*Platichthys flesus*), 2-Spotted Goby (*Gobiusculus flavescens*), Sand Goby (*Pomatoschistus minutes*), Common Goby (*Pomatoschistus microps*), European Eel (*Anguilla anguilla*), Long-Spined Sea-Scorpion (*Taurulus bubalis*), 5-Bearded Rockling (*Ciliata Mustela*), Pogge (*Agonus cataphractus*), Pollack (*Pollachius pollachius*), Lesser Spotted Dogfish (*Scyliorhinus canicular*) and 3-Spined Stickleback (*Gasterosteus aculeatus*).

5. FIELD STUDY

5.1 Baseline Habitats

The Markievicz Bridge is a historic stone masonry structure, classified as **Buildings and artificial surfaces (BL3)** (Plate 5-1)**.** Habitats immediately surrounding the bridge include footpaths, roads and commercial and residential buildings (BL3), with a sparse treeline **(Treeline – WL2)** along road/footpath verges in the southeast and northwest. Species include Sycamore (*Acer pseudoplatanus*), Willow (*Salix* spp.) and Ash (*Fraxinus excelsior*). An area of **scrub (WS1)** is located approximately 85m east (upstream) of the Proposed Works on the right-hand bank of the Garavogue River.

The extent of the Garavogue River within Sligo Town is categorised as a **Tidal river (CW2).** The river is approximately 35m wide at the location of the Proposed Works. The depth of the river fluctuates as a result of tidal influences and a weir structure located upstream of the Proposed Works (Plate 5-2 and Plate 5-3), as described above in Section 4.6.2.1 above.

Vegetation growth present on the surface of the bridge structure includes Maidenhair spleenwort *(Asplenium trichomanes),* Hart's-tongue fern *(Asplenium scolopendrium),* Ivy-leaved Toadflax *(Cymbalaria muralis),* Ivy *(Hedera spp.).* Willowherbs *(Epilobium spp.)* and the non-native invasive species Butterfly bush *(Buddleja davidii)* are also present growing on flat surfaces within the bridge piers.

Four streetlights are located directly on the bridge structure itself, and a set of traffic lights are present on the south end of the bridge. Additional streetlights can be found along the right-hand bank and the left-hand bank of the Garavogue River both upstream and downstream of the Markievicz Bridge (Plate 5-1).

The non-native species Winter Heliotrope *(Petasites fragrans)* was found on the right-hand bank upstream of the Proposed Works. The Third Schedule (European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011)) species Zebra mussel *(Dreissena polymorpha)* was recorded within the proposed works area in the Garavogue River.

Plate 5-1 Markievicz bridge (BL3) from the south bank of the Garavogue River (facing northeast). Downstream view of the Proposed Works.

Plate 5-2 The Garavogue River (CW2), upstream of the Markievicz Bridge facing downstream

Plate 5-3 Garavogue River (CW2) with high water levels

Plate 5-4 Garavogue River (CW2) at low tide

5.1.1 River Habitat Assessment

5.1.1.1 Upstream of the Markievicz Bridge

The following section describes the habitat upstream of the Markievicz Bridge within the Proposed Works footprint in the Garavogue River. The Garavogue River within the vicinity of the Proposed Works is categorized as a tidal river (CW2).

Properties of the watercourse at this location are provided in Table 5-1 below and a representative photograph of the survey location is shown in Plate 5-5.

Table 5-1 Properties of the watercourse upstream of the Markievicz Bridge within the Proposed Works footprint

Properties	Record			
Average Depth (m) at the time of the survey	0.2 – 0.8m			
Average Bank Width (m)	35m			
Wet width (m)	35m			
Flow	Moderate			
Color	Slightly brown			
Clarity	Clear			
Bank height (m)	**LHB:**	2-3m	**RHB:**	2-3m
Dominant Substrates	30% Boulder			

	20% Cobble 65% Fine (2-8mm) and Coarse (8-32mm) Gravel
Substratum Condition	Loose

Plate 5-5 Representative photograph of the Garavogue River upstream of the Markievicz Bridge

Plate 5-6 River channel upstream of the Proposed Works

The watercourse upstream of the Markievicz Bridge had a moderate flow and velocity with sections of riffle, pool and glide. The water was clear with a slight brown coloration. Siltation was low across the channel with occasional deposits of silt located in deeper pool section, along the banks and in the interstitial spaces between boulders and cobbles. Submerged and emergent macrophytes were common with approximately 50% percentage cover, including *Myriophyllum spicatum, Ranunculus spp.*, *Fontinalis antipyretica*, with small quantities of filamentous green algae. The substrate of the watercourse upstream of the bridge was dominated by fine and coarse gravels, with a lesser quantity of boulders and cobbles. A higher percentage of gravels was found on the right-hand side of the river (approx. 70%) and lesser on the left-hand bank (approx. 55%).

The right-hand bank (RHB) and left-hand banks (LHB) upstream of Markievicz Bridge both consisted of modified banks consisting of man-made retaining walls classified as Buildings and artificial surfaces (BL3). Some patches of riparian vegetation were present approximately 90m upstream of the proposed works area on the RHB, consisting of scrub (WS1) with Common reed *(Phragmites australis)* and Willows *(Salix spp.)* growing within the river. No vegetation growth was present on the LHB upstream of the bridge, however a sparse treeline was present within the footpath adjoining the riverside walk. Further upstream of the proposed works area, residential buildings have been built up to the edge of the riverbank. Approximately 350m upstream of the Markievicz Bridge is the John Fallon footbridge with an existing weir.

5.1.1.2 Downstream of the Markievicz Bridge

The following section describes the habitat downstream of the Markievicz Bridge within the Proposed Works footprint in the Garavogue River. The Garavogue River within the vicinity of the Proposed Works is categorized as a tidal river (CW2).

Properties of the watercourse at this location are provided in Table 5-2 below and a representative photograph of the survey location is shown in Plate 5-7 and Plate 5-8.

Table 5-2 Properties of the watercourse downstream of the Markievicz Bridge within the Proposed Works footprint

Properties	Record			
Average Depth (m) at the time of the survey	0.2 - 1.0m			
Average Bank Width (m)	35m			
Wet width (m)	35m			
Flow	Moderate to fast, glides and unbroken standing waves in areas			
Color	Slightly brown			
Clarity	Clear			
Bank height (m)	**LHB:**	2-3m	**RHB:**	2-3m
Dominant Substrates	40% Boulder 35% Cobble 15% Fine (2-8mm) and Coarse (8-32mm) Gravel 10% Sand and fine Silts			
Substratum Condition	Loose			

Plate 5-7 Representative photograph of the Garavogue River downstream of the Markievicz Bridge

Plate 5-8 View across the channel downstream of the Markievicz Bridge

The watercourse downstream of the Markievicz Bridge had a moderate-fast flow with areas of riffle, glide, pool and unbroken standing waves. The water was clear with a slight brown coloration. Siltation was low across the channel with occasional deposits of silt located in deeper pool section, along the banks and in the interstitial spaces between boulders and cobbles. Submerged and emergent macrophytes were present including *Myriophyllum spicatum, Ranunculus spp.*, *Fontinalis antipyretica*, with small quantities of filamentous green algae, but not as common as the upstream stretches. The substrate of the watercourse downstream of the bridge was dominated by cobbles and boulders with gravels found surrounding the larger substrate The substrate at the LHB consisted of a large area of gravel, sand and silt. This depositional area within the watercourse extended approximately 5m from the LHB into the watercourse.

The right-hand bank (RHB) and left-hand banks (LHB) downstream of Markievicz Bridge both consisted of modified banks consisting of man-made retaining walls classified as Buildings and artificial surfaces (BL3). The RHB approximately 30m downstream of the Proposed Works footprint consisted of a gravel/muddy bank with Willows *(Salix spp.)*, reeds and grasses. Mature trees were found growing within the footpaths on the LHB. The RHB downstream of the bridge is largely made up of man-made structures with sparsely planted trees (treeline – WL2) along the footpaths.

5.1.1.3 River Habitat Underneath the Markievicz Bridge Arches

The following section describes the habitat beneath the existing arches of the Markievicz Bridge within the Proposed Works footprint in the Garavogue River. A representative photograph of the survey location is shown in Plate 5-9.

Plate 5-9 Representative photograph of the Garavogue River beneath the Markievicz Bridge

The riverbed substrate beneath the bridge was dominated by remnant masonry stone, boulders and cobbles, with course gravels and small areas of fine gravels present within the interstitial spaces between boulders and cobbles. The remainder of the riverbed under the bridge consisted of the masonry abutments, all of which demonstrated moderate to significant scour damage. Depth of water under each arch varied across the channel with the arches at the banks being the shallowest. Deeper pools were consistently present at the downstream end of the bridge.

5.1.2 Fisheries Habitat Assessment

5.1.2.1 Upstream of the Markievicz Bridge

Within the proposed works area, spawning habitat for salmonids, sea lamprey and river lamprey was considered to be good upstream of the bridge due to moderate to fast flowing waters, a large proportion of loose fine and large gravels which lamprey and salmonids could utilize to build redds, and a smaller presence of large boulders/cobbles for lamprey to anchor to. (Figure 5-1)

Nursery habitat within the works area upstream of the bridge was considered good for salmonids due to the variability in flow patterns from riffle to glide, well oxygenated waters and the presence of instream submerged vegetation for shelter and refuge. Nursery habitat for lamprey species was considered

moderate within the works area upstream of the bridge due to limited areas of sandy and silty deposits located only in small amounts at the riverbanks.

Holding habitat for salmonids was considered moderate upstream of the bridge within the works area due to the presence of occasional deeper pools near the LHB and in the channel. The works area upstream of the bridge provides moderate habitat for European eel due to the presence of boulders throughout the channel offering refuge and deeper pool areas along the LHB.

It should be noted that the proposed works area only contains a very small percentage of the available good habitat within the river. Further upstream and outside of the proposed works area, there are large areas of suitable salmonid and lamprey spawning gravels, salmonid nursery habitat, sandy and silty deposits providing good lamprey nursery habitat and deep pools with occasional overhanging riparian woody vegetation providing good holding habitat for salmonids and good habitat for European eel.

Additional Survey Recordings

While undertaking the fisheries assessment at this location, Grey Wagtails *(Motacilla cinerea)* were recorded utilising the RHB.

The Third Schedule (European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011)) species Zebra mussel *(Dreissena polymorpha)* was recorded within the proposed works area in the Garavogue River.

5.1.2.2 Downstream of the Markievicz Bridge

The majority of the habitat downstream of the Markievicz Bridge within the proposed works area consists of approximately 50% Boulder and 35% Cobble substrates with the remaining substrate consisting predominantly of fine gavels. This substrate is too coarse and compacted to provide significant suitable spawning habitat for lamprey species or salmonids and is therefore considered poor spawning grounds for lamprey or salmonid species. (Figure 5-1)

A large gravel, sand and silt bed is present from the edge of the LHB to the first bridge pier (Approximately 4m of riverbed in width), which provides good lamprey nursery habitat. The concrete platform located upstream of this depositional area as well as the gradient of the river has resulted in conditions for the natural accumulation of finer substrate along the LHB. Nursery habitat for salmonids is considered poor-moderate due to the overall deeper waters downstream of the bridge. However, some areas of the channel presented ample instream submerged vegetation and riffle habitat resulting in transitional areas of riffle to glide where nursery age salmonids may utilize. This habitat is located within the proposed dry working area, however of the proposed riverbed scour repairs will be undertaken within this habitat area.

Holding habitat for salmonids and habitat for European eel downstream of the bridge within the proposed working area was considered moderate-good due to the abundance of deeper pools but the lack of shelter or shading from riparian vegetation.

A historic weir was recorded approximately 200-250m downstream, with an existing fish passage. This is located entirely outside of the proposed working area.

Additional Survey Recordings

While carrying out an otter survey downstream of the Proposed Works, a Grey Heron *(Ardea cinerea)* was recorded fishing near the existing downstream weir. Grey Wagtails *(Motacilla cinerea),* Pied Wagtails *(Motacilla alba yarrellii)* and Mallards (*Anas platyrhynchos)* were recorded downstream of the Proposed Works.

The Third Schedule (European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011)) species Zebra mussel *(Dreissena polymorpha)* was recorded within the proposed works area in the Garavogue River.

5.1.2.3 Underneath the Markievicz Bridge Arches

The habitat beneath the bridge arches is assessed as poor for lamprey and salmonid spawning due to the predominantly course substrate consisting of large masonry stones, cobbles and boulders. Although some fine sediments have deposited where the piers have scoured and in between the cobbles, boulders and masonry stones, it is unlikely that these areas would provide significant supporting spawning habitat.

Nursery habitat for salmonids underneath the bridge was assessed as poor, and nursery habitat for lamprey was assessed as poor due to lack of significant suitable nursery silt beds.

Holding habitat for salmonids and habitat for eel was considered moderate due to the presence of deep pool sections, large boulders for refuge and undercut abutments.

5.2 Fauna

5.2.1 Birds

During the river habitat and fisheries assessment, an assemblage of bird species typical of urban watercourses were recorded, including Grey Heron *(Ardea cinerea)* was recorded fishing near the existing downstream weir. Grey Wagtails *(Motacilla cinerea),* Pied Wagtails *(Motacilla alba yarrellii) Mute Swans (Cygnus olor)* and Mallards (*Anas platyrhynchos)* were recorded downstream of the Proposed Works. No birds were recorded nesting within the bridge structure.

5.2.2 Otter

Otter surveys were undertaken along both banks of the Garavogue River for at least 150m both upstream and downstream of the Proposed Works. No signs of otter, including holts, slides, couches, prints, spraints or feeding remains, were found during the survey. However, the Garavogue River provides good supporting habitat for otter and it is likely that the species occurs at the site for commuting/foraging.

Map Legend

- Extent of Proposed De-watered Area
- Suitable Nursery Habitat
- Good Spawning Habitat
- Poor Spawning Habitat
- Buildings and artificial surfaces (BL3)

N

Drawing Title
Fisheries Habitat Assessment Map

Project Title
Markievicz Bridge Scour Repairs

Drawn By	Checked By
EF	PR
Project No.	Drawing No.
220943	Figure 5-1
Scale	Date
1:625	27/03/2025

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5.2.3 Bats

5.2.3.1 Bat Habitat Appraisal

With regard to foraging and commuting bats, the proposed works site and river are considered of *Moderate* suitability due to the good linear connectivity to the surrounding habitats. However, the presence of scrub at the northern border of the river to the east and west provide some foraging opportunities, and connectivity to the wider landscape. Urban areas, which surround the bridge, are considered of *Low* suitability.

5.2.3.2 Preliminary Roost Assessment

Despite the urban area, the bridge is located in proximity to quality foraging habitat to the east and the west and multiple potential access points were identified and therefore, Markievicz Bridge was assigned a *Moderate* roosting potential.

5.2.3.3 Dusk Emergence Surveys

During the survey on the 17th September 2024, six Soprano pipistrelles were observed emerging from the stonework beneath the second to northernmost arch under the bridge. Soprano pipistrelle was the most recorded species during this survey (n=665), followed by Common pipistrelle (n=134) and, to a lesser extent, Leisler's bat (n=25). Soprano and Common pipistrelles were observed foraging under the two northernmost arches of the bridge. A small number of Leisler's bats were recorded commuting during the manual survey.

No bats were observed emerging from the bridge during the survey on the 1st October 2024. Higher Soprano pipistrelle activity (n=1060) was recorded during this survey. Instances of Common pipistrelle (n=120) were less than that recorded during the survey on the 17th September. Foraging and social behaviours were observed at the two northernmost arches of the bridge. No Leisler's bats were recorded. The full results and findings from the bat surveys carried out can be found below in Appendix 1.

5.2.3.4 Conclusion of Bat Surveys

The Markievicz Bridge is located within the known range of seven species of Irish bats. Bats were recorded in the vicinity of the bridge during each of the manual surveys. Soprano pipistrelle activity was higher than any other species during all of the surveys. Leisler's bats were only recorded during the first manual survey carried out on the 17th of September 2024. Soprano pipistrelles were observed consistently foraging and socialising at the two northernmost arches during both of the surveys on the 17th of September and the 1st of October 2024.

A Soprano pipistrelle roost was identified under the second to-northmost arch of the bridge. Six bats were observed emerging from the structure during the September survey, and no bats emerged during the October survey. The roost is likely a small day roost or a small maternity roost (Reason & Wray, 2023) and is not likely to be a hibernation roost.

5.3 Invasive Species

The Third Schedule (European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011)) species Zebra mussel *(Dreissena polymorpha)* was recorded within the proposed works area in the Garavogue River.

5.4 Importance of Ecological Receptors

Table 5.1 lists all identified receptors and assigns them an ecological importance in accordance with the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009). This table also provides the rationale for this determination and identifies the habitats that are Key Ecological Receptor.

Table 5-3 Importance of Ecological Receptors

Habitat and Geographic Importance	KER Y/N	Rationale
Designated Sites		
European Designated Sites › Lough Gill SAC (001976) › Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC (000627) › Cummeen Strand SPA (004035) ***International Importance***	Yes	These designated sites have been assigned International Importance as they are sites designated as part of the Natura 2000 Network under the EU Habitats Directive. The Proposed Works are located within Lough Gill SAC and upstream of the Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC and the Cummeen Strand SPA. Therefore, there is a pathway for significant effect associated with the Proposed Works. **These European Sites are considered as KERs given their International Importance to the Natura 2000 network in Ireland, the QI/SCI habitats and species that these sites are designated form as well as their connection to the wider EU natura 2000 network.**
Nationally Designated Sites › Lough Gill pNHA › Cummeen Strand/Drumcliff Bay (Sligo Bay) pNHA ***National Importance***	Yes	These National Sites have been assigned National Importance as they are sites proposed to be designated as a Natural Heritage Area (NHA). These pNHAs overlap with the above listed European Sites which are considered as KERs. The pNHAs are therefore assessed under the same considerations for potential pathways for significant effects as those listed above for the SAC/SPAs. **Therefore, these National Sites are included as a KER.**
Habitats and Species		
Local Importance (Higher value)	No	The Markievicz Bridge is a stone bridge structure entirely classified as Buildings and Artificial surfaces

› Buildings and artificial surfaces (BL3) (Markievicz Bridge)		(BL3). The bridge structure itself will be retained and is and is therefore not considered as a KER. The Proposed Works will involve de-vegetation on the bridge structure surface. Although vegetation will be lost, species present (as outlined in Section 3.3.1) are common and are not considered of high ecological significance. Therefore, vegetation removal and the Markievicz Bridge are not considered as KERs.
Low Ecological Significance › Buildings and artificial surfaces (BL3) – habitats within the immediate vicinity of the Markievicz Bridge	No	Hard standing surfaces within the vicinity of the Proposed Works will be utilized for temporary construction site compound during the construction phase of the Proposed Works. These habitats include footpaths and roads associated with the surrounding urban landscape of Sligo Town. These habitats do not have any ecological significance at a local, national or international scale and are common and widespread within the surrounding areas of the Proposed Works. The BL3 habitat within the vicinity of the Proposed Works are therefore not considered as a KER.
International Importance › QI of relevant European Sites ***Local Importance (higher value)*** › Aquatic Fauna	Yes	There is potential that the proposed Works may result in the following impacts: › Potential deterioration of water quality during the construction phase of the Proposed Works. › Potential for direct mortality of QI designated species as a result of the proposed in-stream works. › Potential for the loss of riverbed habitat as a result of the riverbed scour repairs and in-stream works associated with the Proposed Works. › Potential for the dry working area created within the Garavogue River to result in a barrier to migration of mobile QI designated species within the river. **As a result of the pathways identified above, QI of relevant European Sites and Aquatic Fauna are considered as a KERs.**
International Importance › Otter (*Lutra lutra*)	Yes	The Garavogue River, which forms part of Lough Gill SAC, provides suitable supporting habitat for this species for commuting/foraging. The Proposed Works may result in a deterioration of downstream water quality within the Garavogue River as a result of the scour repairs and de-vegetation works. A deterioration in water quality could lead to fish mortality in the area and lead to a decrease in prey biomass for otter. There is also potential that the proposed works involving a dry working area in the river may result in

		a temporary barrier to migration of this species for the duration of the construction phase of the works. There is also potential that the Proposed Works may result in disturbance effects on this species which may be present foraging or commuting in proximity of the Proposed Works. **Therefore, otter is considered as a KER.**
Local Importance (Higher value) › Bats	Yes	A Soprano Pipistrelles (*Pipistrellus pygmaeus*) roost was identified under the second to northern-most arch of the Markievicz Bridge. The proposed works has potential to result in the loss of a known bat roost within the bridge structure. With regard to foraging and commuting bats, the proposed works area was considered to have *Moderate* commuting/foraging suitability for bats overall due to the location of the bridge on the Garavogue River and the existing linear connectivity. **Therefore, bats are considered as KERs.**
Local Importance (Higher value) › Birds	Yes	The Proposed Works is located within the Garavogue River, which is directly upstream of the Garavogue Estuary via 230m surface water distance from the Proposed Works. Both the tidal Garavogue River and the Garavogue Estuary likely provides suitable foraging habitat for local waterbird populations and is likely used on occasion. As outlined in the sections above, there is potential for the proposed works to result in significant effects on water quality, which has potential to significantly affect the supporting habitat for waterbirds during the construction phase of the Proposed Works. Although there was no evidence of birds nesting within the bridge at the time of the surveys undertaken, there is potential for disturbance effects during the construction phase of the Proposed Works on local bird species which may utilize the Markievicz Bridge for nesting. **Birds are therefore included as a KER and will be considered further.**

6. ECOLOGICAL IMPACT ASSESSMENT

6.1 Do Nothing Impact

If the proposed works were not to proceed, the existing Markievicz Bridge would remain in use as a pedestrian and vehicle bridge. As outlined in Section 2.2.1, it is anticipated that the scour damage on the bridge abutments and the existing vegetation growth on the bridge over time will lead to damage to the structural integrity of the bridge. Over time, the scour damage and vegetation growth would continue to progress, causing further structural damage to the bridge over time. This could ultimately lead to a significant safety risk to bridge users.

If the riverbed scour repair works were not to proceed, the river channel bed immediately upstream and downstream of the Markievicz bridge would likely continue to scour, particularly given the existing hydraulic jump present along the riverbed coupled with the existing flow of the river. The continued scour of the riverbed could ultimately result in a reduction in structural integrity of the Markievicz bridge abutments within the river given the impact that the existing scour damage is causing to the bridge itself.

6.2 Impacts during the Construction Phase

The activities associated with the construction phase of the proposed works will not result in the loss of any habitats identified as non-KERs. Therefore, there will be no significant effects on any of habitats and species not listed as a KER in the table above.

The following sections outline the potential impacts associated with the construction phase of the proposed works.

6.2.1 Assessment of Potential Impacts on Aquatic Species and Associated Fauna

Table 6-1 Assessment of potential impacts on Aquatic Species and Associated Fauna during the construction phase

Description of Effect	**Potential for Deterioration of Water Quality** A potential pollution event associated with the instream works may result in a deterioration of water quality within the Garavogue River. Such an event may also occur during the steam cleaning and use of lime mortar associated with the de-vegetation works, as well as the use of concrete associated with the bridge abutment repair works. A deterioration of water quality within the Garavogue River has potential to impact on both local aquatic fauna, the aquatic QI designated species of Lough Gill SAC, as well as the aquatic designated fauna of the Cummeen Strand/Drumcliff Bay SAC (Sligo Bay) and the Cummeen Strand SPA, both downstream of the Proposed Works. **Loss of Riverbed Supporting Habitat** As outlined in Section 3.3.4.2, riverbed habitat upstream of the bridge within the proposed works area contains good lamprey and salmonid spawning habitat, while the downstream and under-arch habitat within the works area contains poor spawning habitat. The proposed riverbed scour repairs will result in the temporary loss of

	riverbed habitat upstream of the bridge, and permanent riverbed habitat loss downstream of the bridge within the works area. **Disturbance and Direct Mortality** The creation of the dry working area within the Garavogue River has potential to result in direct mortality of aquatic fauna. There is also potential that the works involving scour repairs, de-vegetation, steam cleaning and repointing may result in disturbance effects to aquatic fauna which may be present within the Garavogue River during the construction phase. **Barrier to Migration** The dry working area associated with the Proposed Works will encompass half of the width of the river at any time during the Proposed Works. The total dry working area will be approximately 980m^2 in total and will extend approximately 6m upstream of the bridge and approximately 15.5m downstream of the bridge, however the riverbed scour repairs will encompass a much smaller area within the dry working area. As outlined in Section 2.2.2.4, the main riverbed scour repairs will occur downstream of the bridge, and minor, shallow repairs will occur upstream of the bridge within the working area. There is potential that this may result in a barrier to migration of migratory faunal species which may utilize the Garavogue River for the duration of the construction phase.
Assessment of significance prior to mitigation	**Potential for Deterioration of Water Quality** There is potential that a pollution event associated with the proposed in stream works may result in a temporary, significant effects on both a local scale on local aquatic faunal species and international scale on the designated aquatic species of Lough Gill SAC and the Cummeen Strand/Drumcliff Bay SAC (Sligo Bay) and the Cummeen Strand SPA. **Loss of Riverbed Supporting Habitat** Given that the riverbed habitat within the works area downstream and beneath the bridge arches does not provide good spawning, holding or nursery habitat, the permanent loss of riverbed habitat downstream and beneath the bridge arches will be a permanent, not significant effect at any geographical scale. The riverbed habitat upstream of the bridge within the proposed works area contains good spawning habitat. However, this effect is temporary and fully reversable and will not result in permanent significant effects on any of the KER species. **Disturbance and Direct Mortality** There is potential that the in-stream works associated with the proposed works may result in temporary disturbance to aquatic fauna, however this will not be significant at any geographical scale. While disturbance won't be significant. There is potential that the proposed works may result in significant effects on the KER species if carried out during the spawning season for KERs, such as lamprey and salmonid. Mitigation has been provided below to prevent any disturbance or mortality to aquatic species that may be present within the river during the construction phase. **Barrier to Migration** Given that the proposed works will only take place spanning approximately half of the width of the river (dry working area 980m^2 in total and will extend approximately 6m upstream of the bridge and approximately 15.5m downstream of the bridge) at any

	given time during the proposed works, in-stream works will result in a temporary, not significant effects at any geographical scale. However, mitigation has been provided below to prevent any potential impacts associated with barriers to migration.
Mitigation	**Potential for Deterioration of Water Quality** With regards to the potential water quality impacts associated with the construction phase of the Proposed Works, mitigation has been provided in Section 6.2.3 below. **Loss of Riverbed Supporting Habitat** › An electric 1.5 tonne mini digger will be the only machinery permitted within the dry working area. › The suitable lamprey and salmonid nursery habitat downstream of the bridge on the south side (near the LHB) will be entirely marked out. There will be no machinery or personnel permitted within this area. › Upstream of the Markievicz Bridge, the existing riverbed material will be re-spread over the areas damaged by scour and finished to natural riverbed levels. **Disturbance and Direct Mortality** › No works will take place during the spawning season for lamprey (May to June) and salmonid (November to March) › Instream works will only be carried out during the fisheries open season which is from 1st July to 30th of September each year; › Inland Fisheries Ireland will be contacted and consulted at least 1 month prior to the outset of works. All works will take place under guidance of the IFI officer. › Instream works will be carried out in consultation with Inland Fisheries Ireland (IFI) and in line with IFI (2016) *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters;* › A dry working area will be set up within the river using 1-tonne sand bags stacked at double height. The working area will be dewatered. However, in advance of dewatering, fish salvage from the works area will be undertaken via electro-fishing. With regard to lamprey ammocoetes which may potentially be present in riverbed sediments, the following mitigation will be in place: › The translocation individuals will be relocated to a suitable similar river habitat location within the same grid reference. › Any material removed from the riverbed will be checked by a suitably trained Ecologist under a Section 14 licence via manual hand search for any aquatic fauna including lamprey and European eel. These species are known to rise to the surface of excavated material for easy recovery by net. › A second check for aquatic fauna will be carried out once the material has been offloaded into the final disposal area in order to ensure a thorough search through the excavated silt. › On a precautionary basis, if White Clawed Crayfish are found within the working area, these will be safely translocated in a similar manner under licence.

	Barrier to Migration › The dry working area required for the in-stream works will only span half of the width of the river at any given time. The river will be left to flow through the remaining half of the river. › The riverbed scour repairs upstream of the bridge will involve re-spreading accumulated materials on the riverbed where scour damage has occurred. › The finished river level will not change from the existing levels. › Following the completion of the construction phase, all materials remaining within the dry working area and all bunding materials (i.e. sandbags and plastic membranes) will be removed from the river. No materials shall be left within the river when the dry working area is rewet. **Ecological Clerk of Works (ECoW)** › The ECoW will be present for all works taking place upstream of the bridge, in areas identified as providing suitable spawning habitat. › Once the dry working area has been established, the ECoW will be responsible for making out the area of suitable nursery habitat in the south (RHB) downstream of the bridge. (Figure 6-2) › The ECoW will ensure that all machinery and personnel do not enter this area at any stage during the construction phase. With regards to the potential impacts as a result of the introduction of invasive species during the construction phase of the Proposed Works, a biosecurity protocol has been set out below in Section 6.2.3 will apply to ensure that there will be no potential for significant effects.
Residual effect following mitigation	**Potential for Deterioration of Water Quality** Following the incorporation of mitigation measures described above, no potential for significant water quality impacts have been identified at any geographic scale. **Loss of Riverbed Supporting Habitat** Following the incorporation of mitigation measures described above, no potential for significant effects on riverbed supporting habitat have been identified at any geographic scale. **Disturbance and Direct Mortality** Following the incorporation of mitigation measures described above, no potential for significant effects via disturbance and direct mortality have been identified at any geographic scale. **Barrier to Migration** Following the incorporation of mitigation measures described above, no potential for significant effects via barrier to migration have been identified at any geographic scale.

6.2.2 Impacts to Fauna

6.2.2.1 Assessment of Potential Effects on Bats

Table 6-2 Assessment of impacts on bats associated with the construction phase

Description of Effect	**Loss of Roosting Habitat** One active soprano pipistrelle roost was identified during manual surveys. The bridge was assessed as having *Moderate* roosting potential. The construction phase has the potential to result in habitat loss to local bat species by modifying roosting features. Potential effects on roosting bats may include: › Direct impacts via removal/destruction of bat roosting habitat. › Direct mortality of roosting bats. The de-vegetation works do not have potential to result in the loss of the known roost located within the second northern-most arch of the Markievicz Bridge. However, the absence of mitigation, the re-pointing works on the bridge surface with the use of lime mortar has potential to result in the loss of the known roost. **Loss of Commuting/Foraging Habitat** With regard to foraging and commuting bats, the Proposed Works site is considered to have *Moderate* suitability for bats overall due to the good linear connectivity to the surrounding area, including being located directly within the Garavogue River. A short-term loss of commuting habitat may occur should scaffolding be erected for sustained periods of time within the dry working area in the river. No long-term loss of commuting/ foraging habitat is anticipated.
	Disturbance During the construction phase no works are proposed during nighttime hours and no additional lighting is proposed. However, the removal of vegetation and cleaning of the bridge structure has the potential to disturb roosting bats within the bridge.
Assessment of Significance prior to mitigation	**Loss of Roosting Habitat** In the absence of mitigation, there is potential that the re-pointing works may result in the loss of a known roost, which would have a significant effect on bats at a local scale. Mitigation has been provided below to prevent the loss of the known roost within the bridge structure. **Loss of Commuting/Foraging Habitat** No significant loss of bat commuting or foraging habitat is anticipated as a result of the Proposed Works. In the absence of mitigation there is potential for a temporary loss of commuting/foraging habitat within the vicinity of the bridge for the duration of the construction phase.
	Disturbance In the absence of mitigation, there is potential for significant disturbance to bats on a local scale during the construction phase. Therefore, mitigations have been proposed to limit any potential impacts.
Mitigation	

Loss of Roosting Habitat

- A pre-commencement survey and inspection beneath the bridge arches will be undertaken to ensure that the known location of the existing roost is clearly identified, and to ascertain whether any additional crevices in the bridge have been occupied by bats. The requirement for a pre-commencement survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice.
- A qualified ecologist will inspect the vegetation to be removed prior to works to ensure that no bats are roosting within, and to identify any potential crevices suitable to roosting bats beneath the bridge arches. Ivy will only be removed by hand or using hand tools.
- An ECoW will be present for all works beneath the arch with the known roost.
- The known roost location will be clearly marked out with tape or chalk.
- All staff will be made aware of the location of the roost and the mitigation measures.
- No steam cleaning or repointing works will be permitted within 2m of the roost location.
- All holes within the bridge structure not used by bats will be temporarily filled with bubble wrap to prevent bats from occupying these locations for the duration of the construction phase. The bubble wrap will be removed following the proposed works.
- Two artificial roosting brick structures (such as the Brick Roost 1GS) will be erected onto the side of the bridge to provide additional roosting habitat for bats, following best practice guidelines (Kelleher & Marnell 2006, NRA 2006). Bat boxes will have a southerly orientation and be positioned at least 3m from the ground, away from artificial lighting. Final bat box locations will be agreed by the project ecologist.

Loss of Commuting/Foraging Habitat

No tree felling or removal of linear connectivity is proposed as part of the repair works. All scaffolding to be erected for extended periods of time during the construction phase will not obstruct commuting/foraging corridors or sever these corridors from the roost location. Scaffolding used will not wrapped or panelled to allow bats to commute freely in between the poles of the scaffolding.

Disturbance

- A derogation license has been granted from the NPWS in advance of the works. The derogation license will be valid for the construction phase and all works will adhere to all measures stipulated in the derogation license.
- No works will be undertaken outside of daylight hours.
- All vegetation removal, repointing and steam cleaning works undertaken below the arch with the known roost will be undertaken by hand.
- No steam cleaning or re-pointing will take place within a 2m radius of the known roost location.
- All plant and equipment for use will comply with Statutory Instrument No 359 of 1996 “European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1996”.
- Plant machinery will be turned off when not in use.

With regard to potential noise disturbance to bat species during construction of the Proposed Works, mitigations set out in Section 6.2.2.2 will apply to ensure there is no potential for significant effect.

Residual Effect following Mitigation	**Loss of Roosting Habitat** Following the incorporation of mitigation measures above, the Proposed Works will not result in the loss of any bat roosts within the site. **Loss of Commuting/Foraging Habitat** Following the incorporation of mitigation measures above, the Proposed Works will not result in the loss of any bat commuting/foraging habitat within the site.
	Disturbance Following the incorporation of mitigation measures described above, no potential for significant disturbance/displacement impacts of bats has been identified at any geographic scale.

6.2.2.2 Assessment of Potential Effects on Otter

Table 6-3 Assessment of impacts on otters associated with the construction phase

Description of Effect	The construction phase of the Proposed Works will involve the use of a machinery within the Garavogue River. There is potential that the Proposed Works may result in disturbance to this species which may be present foraging or commuting in proximity of the Proposed Works. Additionally, a potential pollution event associated with the instream works may result in a deterioration of water quality within the Garavogue River. Such an event may also occur during the steam cleaning and use of lime mortar associated with the de-vegetation works, as well as the use of concrete associated with the bridge abutment repair works. This has potential to impact on the supporting habitat and prey biomass for otters.
Assessment of significance prior to mitigation	The proposed works area is located within an urban setting which is subjected to regular disturbance. The construction phase of the Proposed Works is will not result in any significant additional disturbance effects on otters at any geographical scale. However, by taking the precautionary principle, mitigation has been provided below. In addition, a potential for significant effect to otter has been identified as a result of deterioration in water quality during construction of the Proposed Works.
Mitigation	› A pre-commencement survey for otter will be carried out prior to any works commencing. Should an otter holt be recorded within 150m of the proposed works, a derogation license will be obtained from NPWS and works carried out in accordance with NRA (2006) Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes. The otter survey will be carried out no more than 10 months in advance of construction works commencing. › All plant and equipment for use will comply with Statutory Instrument No 359 of 1996 "European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1996". › Operating machinery will be restricted to the dry working area created within the river and the construction compound at street level. › Work will be completed during daylight hours only. No lighting will be utilized during the construction phase. › Regular maintenance of plant will be carried out in order to minimise noise emissions.

	With regard to potential impacts to otter as a result of deterioration in water quality during construction of the Proposed Works, mitigations set out in Section 6.2.3 will apply to ensure there is no potential for significant effect.
Residual effect following mitigation	Following the incorporation of mitigation measures described above, no potential for significant disturbance impacts on otters has been identified at any geographic scale.

6.2.2.3 Assessment of Potential Effects on Birds

Table 6-4 Assessment of impacts on birds associated with the construction phase

Description of Effect	The construction phase of the Proposed Works will involve the use of a machinery within the Garavogue River which has potential to result in noise impacts on local bird species which may be present within the area. There is potential that the Proposed Works may result in disturbance to local waterbird species which may be present foraging or commuting in proximity of the Proposed Works. Although there was no evidence of any birds nesting within the bridge structure at the time of the surveys carried out, the Proposed Works will be carried out during the bird nesting season and therefore there is potential that nesting birds may occupy the bridge structure in the interim period before the commencement of works.
Assessment of significance prior to mitigation	The proposed works area is located within an urban setting which is subjected to regular disturbance. The construction phase of the Proposed Works will not result in any significant additional disturbance effect on local bird species at any geographical scale. No nests were found during the surveys carried out at the Markievicz bridge. However, if nests have occupied the bridge in the interim period before construction commences, there is potential for a temporary, not significant effect at any geographical scale. Mitigation has been provided below to prevent any potential impacts. In addition, a potential for significant effect to birds on a local scale has been identified as a result of deterioration in water quality during construction of the Proposed Works.
Mitigation	› A pre-commencement survey will be undertaken to determine if any nesting birds have occupied the bridge structure prior to the commencement of any works. › No works will be undertaken within 2m of any nest until any young have fledged and the nest is unoccupied. › At least two bird boxes will be erected at the side of the bridge structure to allow for additional bird nesting habitat. › Ledges on the bridge structure which may provide suitable nesting habitat for local bird species will be retained. With regard to potential noise disturbance to local bird species as a result of the construction phase of the Proposed Works, mitigations set out in Section 6.2.2.2 will apply to ensure there is no potential for significant effect. With regard to potential impacts to waterbirds as a result of deterioration in water quality during construction of the Proposed Works, mitigations set out in Section 6.2.3 will apply to ensure there is no potential for significant effect.

Residual effect following mitigation	Following the incorporation of mitigation measures described above, no potential for significant disturbance impacts on birds has been identified at any geographic scale.

6.2.3 Water Quality Mitigation

General Water Quality Measures

- The construction site compound area will be surrounded with solid fencing to prevent surface water run off to the river.
- Access routes will be clearly marked / identified. Access during construction to any working areas will be restricted to land within the outlined works area.
- No works will take place during periods of high rainfall to reduce run-off, potential siltation of watercourses and potential inundation of the dry working area. 'High rainfall' is defined as follows:
  - Rainfall >10 mm/hr (i.e. high intensity localised rainfall event)
  - Rainfall >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day) or,
  - Rainfall total greater than monthly average recorded in 7 consecutive days (prolonged heavy rainfall over a week).

Waste Management

- All waste will be collected in skips at street level and the site will be kept tidy and free of debris at all times.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or recycling.
- All construction waste materials will be stored within the confines of the site compound, prior to removal from the site to a permitted waste facility.

Stockpiling Areas

- Stockpiling of materials will be carried out temporarily within the dry working area and periodically removed throughout the works. No stockpiled materials will be left within the dry working area overnight.
- Temporary stockpiling will take place within the materials storage area in the construction site compound, as outlined in Figure 6-1.

Instream works

- All works will be undertaken during dry weather periods (see definition above) and when river levels are low.
- No works will be undertaken during Spring Tides. All materials and machinery will be removed from the site prior to any Spring Tides or during periods of heavy rainfall.
- Prior to the commencement of works, Inland Fisheries Ireland (IFI) will be notified, and no instream works shall be carried out during the closed season for instream works (October 1st to June 30th). Any in-stream works associated with the Proposed Works will only be carried out during the fisheries open season which is from **1st July to 30th of September** each year.
- All construction methods will adhere to Inland Fisheries Ireland (2016) *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.*
- No instream works will be carried out outside of dry working area
- The dry working area will be fully sealed using 1-Tonne bags filled with clean inert sand to avoid any water ingress. Smaller sandbags will also be used to fully seal the inside of the dewatering area from excessive water ingress, and to weigh down the impermeable plastic membrane.
- The working area will be electro-fished by qualified personnel in advance of dewatering the works area.

Dewatering

- A sump will be dug within the proposed dry working area.
- A pump will be located within the construction site compound at street level. Dewatering of the dry working area will be carried out by pumping the water out of the sump in the bunded, dry working area, through the pump system located within the construction site compound, which will be fitted with a silt buster. The silt bag or siltbuster will allow the water to flow through the geotextile fabric and will trap any of the finer silt and sediment remaining in the water
- The pump located within the construction site compound will be bunded.
- A silt curtain will be established downstream of the dry working area, attached to the bankside.
- The pumped water from the dry working area will be pumped through the silt buster into the area confined by the silt curtain within the Garavgue River. The mouth of the return pipe will be located behind the silt curtain within the river.
- Automated turbidity metres will be installed upstream and downstream of the proposed works area for suspended solids and these will be monitored regularly by an ECoW. If there is a 20% difference between the downstream reading and the upstream reading, then all works will be halted until the source of the problem is rectified.
- All works will be undertaken during dry weather periods (see definition above) and when river levels are low.
- No tools or potentially toxic materials will be stored or left within the dry working area overnight or when there is danger of the dry working area being inundated with water.
- Bio-security measures such a washing of vehicles, plant and equipment prior to mobilisation and de-mobilisation will be adhered to as detailed in the biosecurity measures in Section 6.2.3 below
- Outside of working hours, plant machinery will be parked within the dedicated vehicle parking area in the construction site compound.
- Rewetting of the dry working area will only take place once all concrete is completely cured.

Cement-based Products

- All concrete will be transferred to the dry working area by chute from the site compound into a fully sealed, bunded container.
- All concrete placing will be conducted under controlled conditions to prevent any potential runoff to the river;
- All formwork will be adequately constructed and sealed to prevent leakage or spillage and will have sufficient capacity to support all poured concrete.
- pH checks will be undertaken within the river prior to the commencement of works in order to get a baseline pH value. Regular pH checks will be carried out on any pumped water from the dry works area during cement works. If there is a significant difference in pH between the pumped water and baseline pH reading, then all works will be halted until the source of the problem is rectified.
- No batching of wet concrete will occur within the dry working area.
- Only ready-mixed, self-compacting wet concrete products and pre-cast concrete will be used within the dry working area for the scour repairs on the bridge piers. No mixing of wet concrete will occur within the riverbed at any time.
- Raw or uncured waste concrete shall be disposed of by removal from the site.
- Concrete trucks will be directed back to their batching plant for washout.
- Clearly visible signs shall be placed in prominent locations close to concrete pour areas, stating that washout of concrete lorries is not permitted on the site; and,
- Concrete pour sites shall be free of standing water to mitigate the risk of run-off being polluted with cementitious material.
- Large concrete pours shall be avoided where prolonged periods of heavy rain are forecast, and covers shall be available and used for freshly placed concrete to avoid the surface washing away in heavy rain.
- The de-watered area will only be re-wet once all concrete has been fully cured.

Hydrocarbon Control

- No vehicles or machinery requiring hydrocarbons will be used within the dry working area on the riverbed. The only machinery required to be used within the dry working area will be an electric 1.5 tonne mini digger.
- The storage of oils, fuel, chemicals, hydraulic fluids, etc. will be undertaken in accordance with current best practice for oil storage (BPGCS005, Enterprise Ireland[4]) on an impervious base within a bund and appropriately secured.
- Any fuel storage required will be stored at street level, outside of the in-stream works, within a dedicated materials storage area at street level. See Figure 6-1 below for the location.
- All machinery operating on-site will be steam-cleaned in advance of works and routinely checked to ensure no leakage of oils or lubricants occurs.
- Potential impacts caused by any spillage of fuels, lubricants or hydraulic oils will be reduced by keeping spill kits at locations within the site compound at street level, and accidental spills will be immediately contained, and the contaminated soil removed from the area and properly disposed of.
- Oil booms and oil soakage pads will be kept at the construction site compound and fuel storage area to deal with any accidental spillage.
- All fuels, lubricants and hydraulic fluids shall be kept in secure bunded areas at the dedicated storage area. The bunded area shall accommodate 110% of the total capacity of the containers within it.
- Containers shall be properly secured to prevent unauthorised access and misuse. An effective spillage procedure shall be put in place with all staff properly briefed. Any waste oils or hydraulic fluids shall be put in place with all staff properly briefed. Any waste oils or hydraulic fluids shall be collected, stored in appropriate containers and disposed of offsite in an appropriate manner.
- No refuelling will take place within the construction site compound. Refuelling will only take place at a petrol station.
- Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment;
- All plant and machinery shall be regularly maintained and serviced to minimise release of hydrocarbons.
- Contractors will establish dedicated secure areas at the construction site compound for the storage of fuel and chemicals in mobile bowsers.

Ecological Clerk of Works (ECoW)

- An Ecological Clerk of Works (ECoW) will be present during the entirety of the site set up of the in-stream works and the de-watering process.
- The ECoW will make regular visits to the site throughout the construction phase of the Proposed Works. A minimum of weekly visits will take place during the in-stream works, and details of the functionality and adherence to mitigation measures will be recorded during each visit.
- All mitigation measures will be thoroughly inspected, and the ECoW will initially be present on a daily basis until the site is set up and construction is underway.
- All site visit reports and documentation will be collated into a final report to ensure compliance with the mitigation measures outlined in this EcIA.
- The ECoW will have the authority to stop all of the works on site if the ECoW has reasonable doubt that the prescribed mitigation measures are not being adhered to properly.

6.2.4 Biosecurity Protocol

During the river habitat assessment carried out on the 13th of March 2025, The Third Schedule (European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011)) species Zebra mussel *(Dreissena polymorpha)* was recorded within the proposed works area in the Garavogue River.

Given that instream works are required as part of the Proposed Works, there is a risk of introduction of invasive species, including invasive plants and invasive fauna (e.g molluscs) or disease (e.g crayfish plague) to the aquatic

[4] Best Practice Guide BPGCS005 Oil Storage Guidelines

environment via machinery, equipment or clothing. The following protocols will be adhered to at all stages of the construction of the Proposed Works:

- Ensure staff are fully aware of this protocol before commencement of works
- Instream works are to be carried out in line with Inland Fisheries Ireland (IFI) *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters as well as IFI (2010) Biosecurity Protocol for Field Survey Work as well as IW-AO-SOP-010 Biosecurity Standard Operating Procedure for Aquatic Sampling.*
- All plant and equipment to be cleaned thoroughly and disinfected with 1% Virkon solution or other proprietary disinfectant before entering the water, including all machinery, pumps, hand tools, ropes, etc.
- All plant and equipment and clothing to be brushed down and disinfected with 1% Virkon solution or other proprietary disinfectant.
- Any imported materials must be certified free of invasive species. All imported materials will be fully cleaned down using 1% Virkon solution or other proprietary disinfectant
- Machinery will be cleaned using high-pressure steam cleaning, with water > 40 degrees Celsius.
- Disinfectant to be applied to the undercarriage and wheels of the vehicle and trailer after steam cleaning.
- Footwear will be dipped in or scrubbed with a disinfectant solution (1% solution of Virkon Aquatic or another proprietary disinfection product) and thoroughly dried afterwards.
- All PPE will be visually inspected, and any attached vegetation or debris removed.
- The above cleaning and disinfection procedures will be carried out on all plant, machinery, equipment and clothing before entering the instream works area and after leaving the instream works area before working on a different site.

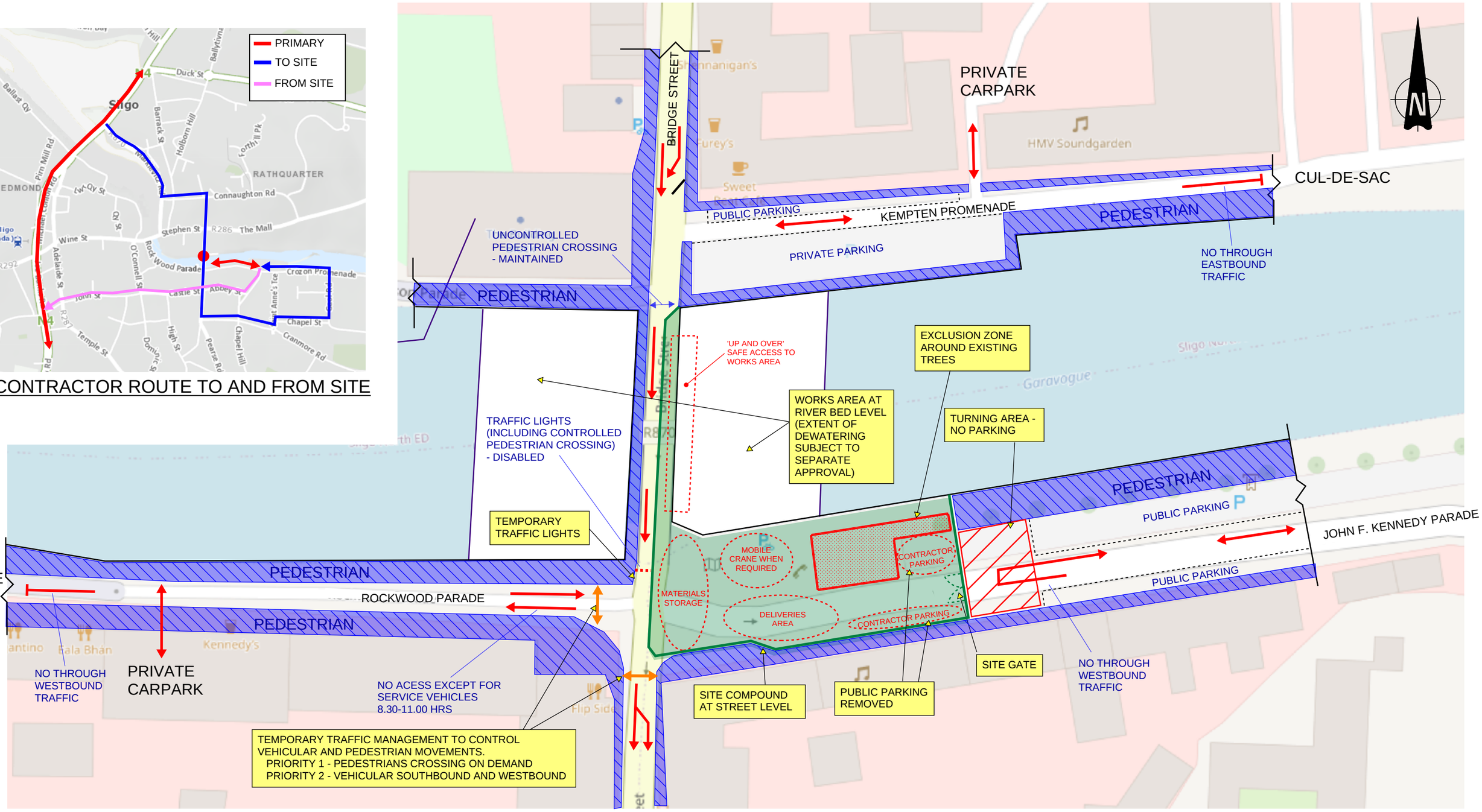
General Site Hygiene

- It will be ensured that all plant, machinery and equipment has been cleaned and brushed down before entering the dry working area to prevent introduction of invasive species into the river.
- Any necessary importation of materials into the dry working area will be certified clean material free of invasive species.

Residual Effects following Mitigation

Following the incorporation of mitigation measures described above, no potential for significant biosecurity impacts have been identified at any geographic scale.

CONTRACTOR ROUTE TO AND FROM SITE



TEMPORARY TRAFFIC MANAGEMENT AND SITE SETUP

PUNCH consulting engineers	PROJECT:	224138 MARKIEVICZ BRIDGE REPAIRS	
	SKETCH TITLE:	CONSTRUCTION TRAFFIC	
	SKETCH NO.	2224138-PUNCH-XX-XX-SK-CS-0006	
	DESIGNER:	KOR	DATE: 18/11/2024

Map Legend

- Extent of Proposed De-watered Area
- Construtsion Site Compound
- Solid Fencing
- Nursery habitat fencing (ECoW)
- Suitable Nursery Habitat

N

Drawing Title

Mitigations Map

Project Title

Markievicz Bridge Scour Repairs

Drawn By	Checked By
EF	PR
Project No.	Drawing No.
220943	Figure 6-2
Scale	Date
1:625	27/03/2025

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6.3 Impacts during the Operational Phase

6.3.1 Assessment of Potential Impacts on Water Quality during the Operational Phase

Table 6-5 Assessment of Potential Impacts on water quality during the operational phase

Description of Effect	The Proposed Works will involve the creation of a dry working area within the Garavogue River. Once the works are completed, all materials will be removed from the dry working are prior to re-wetting the area. The Proposed Works is an existing structure within the centre of Sligo Town which is already subject to vehicle and pedestrian use. There will be no change to the existing hard standing surfaces and therefore no additional water runoff from the bridge structure to the Garavogue River during the operational phase. The riverbed scour repair works will reduce the existing hydraulic jump within the river channel by re-instating the riverbed to its natural levels. Therefore, there will be no significant accumulation or build-up of riverbed materials downstream of the Proposed Works.
Assessment of significance prior to mitigation	The operational phase of the Proposed Works will be permanent, and not significant on any geographical scale in terms of operational impacts on the water quality of the receiving waterbody.
Mitigation	No mitigation will be required given that there are no predicted significant effects on surface water associated with the operational phase of the Proposed Works.
Residual effect following mitigation	No residual impacts on water quality are expected at any scale.

6.3.2 Habitat Loss

There will be no habitat loss associated with the operational phase of the Proposed Works. No direct or indirect impacts on adjacent habitats are considered likely as a result of the operational phase of the Proposed Works.

6.3.3 Impacts to Fauna during Operation

Table 6-6 Assessment of Potential Impacts on fauna during the operational phase

Description of Effect	**Potential for Disturbance Impacts** The Markievicz Bridge is an operational pedestrian and vehicle bridge located within the centre of Sligo Town. It is already subjected to regular disturbance; therefore the operational phase of the Proposed Works will not result in any significant increase in disturbance to local faunal species. **Potential for Barrier to Migration** Following the completion of the construction phase, all materials remaining within the dry working area and all bunding materials (i.e. sandbags and plastic membranes) will be removed from the river. No materials will be left within the river when the dry working area is rewet. Therefore there will be no barriers within the river remaining during the operational phase of the Proposed Works. Riverbed materials which have accumulated as a result of the riverbed scour damage will have been re-spread throughout the works areas where possible during the construction phase. The re-spreading of accumulated riverbed materials may help to prevent future barriers to migration during the operational phase. **Potential for loss of Supporting Riverbed Habitat** As outlined in Section 5.1.1 and 5.1.2, there is poor spawning habitat downstream of the Proposed Works and beneath the bridge where the majority of the riverbed scour repairs will take place, therefore there will be no loss of suitable spawning habitat downstream of the bridge during the construction phase. The existing riverbed materials upstream of the bridge will be re-spread over the riverbed, filling in shallower scour holes during the construction phase. Following the implementation of mitigation measures in Section 6.2.1, the riverbed scour repairs associated with the Proposed Works will not result in any additional loss of QI supporting habitat during the operational phase. Once the construction phase is complete and the dewatered area is removed, the operational phase of the Proposed Works will not result in any further loss of QI supporting habitat.
Assessment of significance prior to mitigation	The operational phase of the Proposed Works will be permanent, and not significant on any geographical scale in terms of impacts on fauna during the operational phase.
Mitigation	No mitigation will be required given that there are no predicted significant effects on fauna associated with the operational phase of the Proposed Works.
Residual effect following mitigation	No residual impacts on fauna are expected at any scale.

6.4 Likely Significant Effects on Designated Sites

6.4.1 Impacts on European Designated Sites

In relation to European sites, an Appropriate Assessment Screening Report and NIS have been prepared to provide the competent authorities with the information necessary to complete an Appropriate Assessment for the Proposed Works in compliance with Article 6(3) of the Habitats Directive.

As per the EPA Guidance (2022), *"a biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement"* but should *"incorporate their key findings as available and appropriate"*. This section provides a summary of the key assessment findings with regard to Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

The Screening for Appropriate Assessment identified the following potential pathways for impact on European Sites included:

'it cannot be excluded beyond reasonable scientific doubt, in view of best scientific knowledge, on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the Proposed Works, individually or in combination with other plans and projects, would be likely to have a significant effect on the following sites:

- Lough Gill SAC [001976]
- Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC [000627]
- Cummeen Strand SPA [004035]

As a result, an Appropriate Assessment is required, and a NIS has been prepared in respect of the Proposed Works in order to assess whether the Proposed Works will adversely impact the integrity of these European Sites.

The NIS concludes:

'Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the, operation and restoration of the Proposed Works will not adversely affect the integrity of European sites.

Therefore, it can be objectively concluded that the Proposed Works, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site.

6.4.2 Impacts on Nationally Designated Sites

The following pNHAs were identified to be within the Likely Zone of Influence of the Proposed Works as they are hydrologically connected to the Proposed Works. A potential for impact due to potential deterioration of water quality as a result of the Proposed Works was identified for the following Nationally Designated Sites:

- Lough Gill pNHA [001976]

- Cummeen Strand/Drumcliff Bay (Sligo Bay) pNHA [000627]

As discussed in Section 6.2.1, a range of mitigation measures are in place to protect surface water receptors as well as impacts to habitats and fauna during construction of the Proposed Works. With the prescribed mitigations in place, there is no potential for significant effects on Lough Gill pNHA and Cummeen Strand/Drumcliff Bay (Sligo Bay) pNHA via the identified pathways.

7. CUMULATIVE IMPACT ASSESSMENT

A search and review in relation to plans and projects that may have the potential to result in cumulative and/or in-combination impacts on the ecology of the site was conducted. This assessment focuses on the potential for cumulative in-combination effects on the existing habitats where potential for significant effects was identified. This included a review of online Planning Registers, development plans and other available information and served to identify past and future plans and projects, their activities and their predicted environmental effects.

7.1 Assessment of Plans

The following plans have been reviewed and are taken into consideration as part of this assessment:

The following development plans have been reviewed and taken into consideration as part of this assessment:

- Sligo County Development Plan 2024-2030
- Northern & Western Regional Assembly Regional Spatial and Economic Strategy 2020-2032
- 4th National Biodiversity Action Plan 2023-2030

The review focused on policies and objectives that relate to biodiversity and natural heritage as listed in the table below.

Plan	Key Policies/Issues/Objectives Directly Related to European Sites in The Zone of Influence	Assessment of development compliance with policy
Sligo County Development Plan 2024-2030	**Biodiversity** **P-BD-1** Protect, conserve, enhance and sustainably manage the natural heritage, biodiversity, geological heritage, landscape and environment of County Sligo. **P-BD-2** Protect and, where possible, enhance the plant and animal species and their habitats that have been identified under EU Habitats Directive (92/43/EEC), the EU Birds Directive (2009/147/EC), European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477/2011) as amended, Flora (Protection) Order 2015, the Wildlife Act 1976 (as amended), and the Wildlife (Amendment) Act 2000 as amended, including all statutory instruments made under each act. **P-BD-3** Ensure that the ecological impact of all development proposals on habitats and species are appropriately assessed by suitably qualified professionals, in accordance with best practice guidelines, taking full account of the precautionary principle where uncertainty exists. **P-BD-4** Minimise adverse impacts of proposed developments on existing habitats (whether designated or not) by including mitigation and/or compensation measures as appropriate. **Designated Sites for Nature Conservation** **P-DSNC-2** Promote the maintenance and, as appropriate, achievement of 'favourable conservation status' of habitats and species in association with the National Parks and Wildlife Service (NPWS). **P-DSNC-3** Carry out an appropriate level of assessment for all development plans, land-use plans and projects that the Council authorizes or proposes to undertake or adopt, to determine the potential for these plans or projects to impact on designated sites, proposed designated sites	The County Development Plan was reviewed with a focus on the potential for cumulative effects to arise on biodiversity in-combination with the Proposed Development. No potential for cumulative effects was identified.

	or associated ecological corridors and linkages in accordance with the Habitats Directive. All appropriate assessments shall be in compliance with the provisions of Part XAB of the Planning and Development Act 2000 (as amended). **P-DSNC-4** Ensure that all development proposals are subject to the process of Screening for Appropriate Assessment and subsequent stages of Appropriate Assessment, as relevant, carried out to the satisfaction of the Planning Authority, in consultation with National Parks and Wildlife Service, as appropriate. **O-DSNC-1** Identify any areas of high nature conservation value which are of major importance for wild fauna and flora in accordance with Article 10 of the Habitats Directive, and which have not been previously identified. **O-DSNC-2** Undertake appropriate surveys and collect data to provide an evidence-base to assist the Council in meeting its obligations under Article 6 of the Habitats Directives (92/43/EEC) as transposed into Irish Law, subject to available resources. **Protected Species** **P-PS-1** Ensure that development does not have a significant adverse impact incapable of satisfactory mitigation on plant, animal or bird species protected by law. **P-PS-2** Consult with the National Parks and Wildlife Service (DHLGH) and take account of any licensing requirements when undertaking, approving, and authorising development which is likely to affect plant, animal or bird species protected by law. **Nature Conservation Outside Designated Sites** **P-NCODS-3** Ensure that proposals for development protect and enhance biodiversity, wherever possible, by minimising adverse impacts on existing habitats and by including mitigation and/or compensation measures, as appropriate, which ensure that biodiversity is enhanced.	

	P-NCODS-5 Ensure that no ecological networks, or parts thereof which provide significant connectivity between areas of local biodiversity, are lost without remediation as a result of implementation of this Plan. **Invasive Species** **P-INV-1** Prevent and control the spread of invasive plant and animal species within the county **Inland Waters** **P-INW-1** Protect rivers, streams and other water courses and their associated Core Riparian Zones (CRZs) from inappropriate development and maintain them in an open state, capable of providing suitable habitats for fauna and flora. Structures (e.g., bridges) crossing fisheries waters shall be clear-span and shall be designed and built in consultation with Inland Fisheries Ireland. **P-INW-2** Protect and enhance biodiversity richness by protecting rivers, stream corridors and valleys by reserving land along their banks for ecological corridors, maintaining them free from inappropriate development and discouraging culverting or realignment. **O-INW-2** Require that runoff from a developed area does not result in deterioration of downstream watercourses or habitats, and that pollution generated by a development is treated within the development area prior to discharge to local watercourses. **Water Quality** **P-WQ-2** Promote compliance with environmental standards and objectives established for surface and groundwater bodies under the Water Framework Directive (WFD). **Architectural Heritage**	

	P-ARH-5 Protect important non-habitable structures such as historic bridges, harbours, railways or non-structural elements such as roadside features (e.g. historic milestones, cast-iron pumps and post-boxes), street furniture, historic gardens, stone walls, landscapes, demesnes and curtilage features, in cases where these are not already included in the Record of Protected Structures.	
Northern & Western Regional Assembly Regional Spatial and Economic Strategy 2020-2032	**5.4 Our Natural Heritage** **RPO 5.4** Encourage the prioritisation of Site-Specific Conservation Objectives (SSCO) for all sites of Conservation Value, designated in EU Directive (i.e. SACs, SPAs) to integrate with the development objectives of this Strategy. **RPO 5.5** Ensure efficient and sustainable use of all our natural resources, including inland waterways, peatlands, and forests in a manner which ensures a healthy society a clean environment and there is no net contribution to biodiversity loss arising from development supported in this strategy. Conserve and protect designated areas and natural heritage areas. Conserve and protect European sites and their integrity **RPO 5.7** - Ensure that all plans, projects and activities requiring consent arising from the RSES are subject to the relevant environmental assessment requirements including SEA, EIA and AA as appropriate **RPO 5.14** Support the conservation of the region's National Monuments and built heritage, being structures that are of special architectural, historic, archaeological, artistic, cultural, scientific, social or technical interest that are of Regional Significance or above.	The strategy was reviewed, with particular reference to Policies and Objectives that relate to biodiversity. No potential for cumulative impacts when considered in conjunction with the current proposal were identified.
4th National Biodiversity Action Plan 2023-2030	› **Objective 1: Adopt a Whole-of Government, Whole of-Society Approach to Biodiversity.** Proposed actions include capacity and resource reviews across Government; determining responsibilities for the expanding biodiversity agenda providing support for communities, citizen scientists and business; and mechanisms for the governance and review of this National Biodiversity Action Plan. › **Objective 2: Meet Urgent Conservation and Restoration Needs.** Supporting actions will build on existing conservation measures. Efforts to tackle Invasive Alien Species will be elevated. The protected area network will be expanded to include the Marine Protected Areas. The ambition of the EU Biodiversity Strategy will be considered as part of an evolving work programme across Government. › **Objective 3: Secure Nature's Contribution to People.** Actions highlight the relationship between nature and people in Ireland. These include recognising the tangible and intangible values of	The 4th National Biodiversity Action Plan has been reviewed in terms of its main objectives and policies relating to sustainable land use, biodiversity and objectives that will strengthen the contribution to international biodiversity initiatives. The Proposed Development will not be contradictory to the Action Plan's policies and objectives.

	biodiversity, promoting nature's importance to our culture and heritage and recognising how biodiversity supports our society and our economy. › **Objective 4: Enhance the Evidence Base for Action on Biodiversity.** This objective focuses on biodiversity research needs, as well as the development and strengthening of long-term monitoring programmes that will underpin and strengthen future decision-making. Action will also focus on collaboration to advance ecosystem accounting that will contribute towards natural capital accounts. › **Objective 5: Strengthen Ireland's Contribution to International Biodiversity Initiatives.**. Collaboration with other countries and across the island of Ireland will play a key role in the realisation of this Objective. Ireland will strengthen its contribution to international biodiversity initiatives and international governance processes, such as the United Nations Convention on Biological Diversity.	

7.2 Other Projects

The potential for the proposed works to contribute to a cumulative impact on European Sites was considered. The online planning system for Sligo County Council was consulted on the 18.03.2025.

A total of 39 applications within the vicinity of the Proposed Works were reviewed and comprised mainly of small-scale private dwelling constructions and/or extensions to private dwellings. In particular, the following projects were reviewed within the vicinity of the Proposed Works:

- Permission for 1. Refurbishment works to protected structure no. 163 SE in the Sligo County Development Plan 2017-2023, The work will include internal modifications to facilitate ground floor entrance lobby and commercial space circa 213m2. Change of use at first and second floor level from commercial to residential use creating 6 no. 1 bedroom apartments and 2 no. 3 bedroom apartments including elevational upgrade works. 2. Demolition of existing rear extensions circa 1,450 m2 forming part of protected structure no. 163 SE in the Sligo County Development Plan 2017-2023. 3. Proposed 4 Storey rear building linked to the protected structure to accommodate 9 no.1 Bedroom apartments, 19 no. 2 bedroom apartments, lift and access stairs and associated circulation space. 4. ESB Substation building circa 24m2 5. Single Storey refuse and storage building circa 61m2 6. Vehicular access via existing Abbey Streetcar Park entrance, 7. All surface car parking, landscaping and associated site works and service connections. (Pl ref: 2460166).
- The development will consist of planning permission for (1) change-of-use from existing retail unit (forming part of protected structure RPS Ref. 202SE/NIAH 32007130) to 1no. accommodation unit; (2) two-storey rear extension above existing flat roof extension to existing building (protected structure RPS Ref. 202SE/NIAH 32007130) to comprise of 2no. accommodation units; (3) internal alterations to existing accommodation unit above retail unit (protected structure RPS Ref. 202SE/NIAH 32007130); (4) change-of-use from public house to accommodation to form extension to existing accommodation unit at ground floor; (5) two-storey extension above existing ground-floor building to form extensions to 2no. existing apartments at first and second floor level; (6) construction of three-storey extension to rear of existing building, to form access stairwell/lobby to existing and proposed accommodation units; (7) change-of-use from public house (known as Leitrim Bar) to 8no. accommodation units; (8) two-storey rear extension above flat roof of existing public house (known as Leitrim Bar) to comprise of 2no. accommodation units; (9) construction of two-storey extension to rear of public house (known as Leitrim Bar), to form access stairwell/lobby to proposed accommodation units; (10) change-of-use from public house (known as O'Neill's Celtic Bar) to 2no. accommodation units; (11) conversion of attic space above existing accommodation unit to provide 1no. additional accommodation unit; (12) two-storey rear extension above flat roof of existing public house (known as O'Neill's Celtic Bar) to comprise of 2no. accommodation units; (13) modifications to fenestration, including additional, repositioning and removal together with all associated siteworks. (Pl ref: 2460081).
- Development at this site of 0.24 hectares at Swanpoint, including works to the existing quay wall a protected structure in the Sligo County Development Plan 2017-2023 Record of Protected Structures. The development will consist of: a) amendments and completion of unfinished Swanpoint building previously approved under planning ref 0470099 to provide 54 no. hotel bedrooms and circa. 2,946 m2 of office space in place of the previously approved 64 no. apartments and 2 no. retail units, b) retention of as constructed elevations, c) ground and first floor extensions circa. 136 m2 to form part of the proposed office space, d) new 2nd floor link between existing hotel and Swanpoint building circa 37 m2, e) refurbishment of the existing quay wall a protected structure as per the Sligo County Development Plan 2017-2023), f) extension of 2 no. existing stair cores and associated link corridors, g) proposed roof top

services including heat pumps and solar panels, h) proposed landscape plan and all associated site works. The documents to be submitted as part of this planning application will include a Natura Impact Statement. (Pl ref: 19446).

- Development consisting of the construction of an LPG gas compound consisting of 3 x 2 Tonne underground gas storage tanks with connection to existing boiler houses, truck set down/filling area and 4 additional car park spaces on the site at Markievicz House, Barrack Street, Rathquarter, Sligo. Constance Markievicz House is a Protected Structure on the site and the proposed development lies within its curtilage. (Pl ref: 20199).
- Permission for a development consisting of the construction of 64 accommodation units in 5 separate blocks with the following typology: 2 no. accommodation blocks with 8 no. Three bed units and 3 no. accommodation blocks with 16 no. Two bed units. Additional works to the site include landscaping, play areas, proposed 204 car parking spaces, boundary treatment, proposed new main entrance and all associated site works and services within the curtilage of a protected structure RPS Ref 12 SE and 13 SE/NIAH 32012037 as identified in the Sligo County Development Plan 2017-2023. (Pl ref: 20445).
- Permission for a development consisting of the construction of a new part single storey/part 2 storey 12 bed residential Hospice Facility extension adjoining Connaught Road, including associated support accommodation. Refurbishment and minor demolitions of the existing hospice facility including existing house and inpatient areas to become support accommodation. The development involves the construction of an undercroft car park, reconfiguration of existing associated car park, extensive landscape scheme to west and south and general minor associated works. The new extension is within the curtilage of a protected structure. (Pl ref: 2046).
- Permission for a development comprising; 1. Accessibility and aesthetic improvements to the Out-Patient's entrance including the provision of a covered ramp, stairs and lift (418m²) and refurbishment of the existing OPD concourse 2. Retention of covid measures to segregate the Emergency Department (red zone) from General Hospital Circulation (green Zone) including temporarily moving the principle public access to The Outpatients Department Entrance on Level 3 on the south façade (The Mall Carpark Side) 3. Provision of 2 no. bus shelters for the shuttle bus service 4. Creation of a new pedestrian access off The Mall giving direct access to the Medial Beds Department under croft (PL18/392 & PL20/375 refer) and temporary main Entrance, with canopy over 5. Provision of a covered walkway to the temporary main entrance 6. Construction of a new internal access road off the main hospital access road, associated retaining walls and site works 7. Alterations to The Mall entrance to improve traffic flow, car park layout, site levels and cycle storage provisions all necessary to enable the above Medical Beds development 8. Minor alterations to parking and road layouts adjacent to the Renal Department to facilitate phasing and delivery of the Medical Beds development (PL18/392 & PL20/375 refer) with minimal disruption or loss of capacity 9. Proposed new signage to assist wayfinding traffic management and orientation. Including all associated landscaping, site works and services. Sligo University Hospital is a Protected Structure. The proposed works are not in immediate contact with the protected structure. (Pl ref: 2260012).
- Planning for (a) Proposed extension of a totalling circa. 141.2 sqm to the rear of the existing building consisting of the following: (b) Retail extension of 15.1 sqm at ground floor to the rear of existing Zulu shop (c) First Floor extension of 15.1 sqm to form part of a duplex apartment (d) Second floor extension of 111 sqm to form duplex apartments (e) Internal reconfiguration and layout to accommodate the 4 duplex apartments (f) Modification of existing external door from Lower Knox Street to access the apartments (g) Site layout alterations to facilitate bin storage, bike and car parking space for the apartments. (Pl ref: 2460429).
- Permission for works, including works to the existing quay wall a protected structure in the Sligo County Development Plan 2017 – 2023 Record of Protected Structures. The development will consist of: a) Amendments of the unfinished Swanpoint building previously approved under planning ref 0470099 to provide 53 no. hotel bedrooms in place of previously

approved apartments and completion of 32 no. apartments, b) Change of use of ground floor apartments to retail unit, and completion of ground floor restaurant unit. c) Retention of as-constructed elevations. d) Ground and first floor extensions circa. 231 sqm to form proposed hotel access and extension to restaurant unit. e) Proposed 8th-floor apartment mezzanine level circa. 34 sqm. f) Refurbishment of the existing quay wall a protected structure as per the Sligo County Development Plan (2017-2023) g) Extension of 1 no. existing stair core and associated link corridor. h) Proposed rooftop services including heat pumps and solar panels. i) Proposed landscape plan and all associated site works. (Pl ref: 2560004)

8. CONCLUSION

Following consideration of the residual effects (post incorporation of best practice measures) it is noted that the Proposed Works will not result in any significant effects on the biodiversity, flora and fauna of the existing environment. Provided that the Proposed Works is constructed and operated in accordance with the design and best practice that is described within this application, significant effects on biodiversity are not anticipated at any geographical scale.

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APPENDIX 1

BASELINE BAT REPORT

Planning and Environmental Consultants

Baseline Bat Report

Markievicz Bridge Scour Repairs, Sligo

DOCUMENT DETAILS

Client:	**Punch Consulting Engineers**
Project Title:	**Markievicz Bridge Scour Repairs, Sligo**
Project Number:	**220943**
Document Title:	**Baseline Bat Report**
Document File Name:	**BBR F – 2025.03.26 - 220943**

Prepared By:

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Planning and Environmental Consultants

Rev	Status	Date	Author(s)	Approved By
01	Final	26/03/2025	DC	SF

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1. INTRODUCTION

1.1 Purpose of this Report

MKO was commissioned to complete a comprehensive assessment of the potential effects on bats, as part of an Ecological Impact Assessment (EcIA) for an application for planning permission of scour repairs and vegetation removal at Markievicz Bridge, Co. Sligo (Grid Reference: G 69329 35946). This report provides details of the bat surveys undertaken, including survey design, methods and results, and recommendation to safeguard bats. An impact assessment based on the information contained in this report is carried out within the accompanying EcIA.

Surveys included a suitability appraisal and roost surveys. The main objective of the surveys was to determine the presence of roosting bats within the bridge. No seasonal scope was designed in 2024 as the information available was considered sufficient to undertake an assessment, in the interest of proportionality.

The bat survey and assessment were informed by a desk study and with reference to the following guidelines:

- *Bat Survey Guidelines: Traditional Farm Buildings Scheme. The Heritage Council, Áras na hOidhreachta, Church Lane, Kilkenny (Aughney, T., Kelleher, C. & Mullen, D., 2008)).*
- *'Bat Workers' Manual' (3rd edn). JNCC, Peterborough (Mitchell-Jones, A.J. & McLeish, A.P. (eds) 2004).*
- *The Lesser Horseshoe Bat Conservation Handbook, Vincent Wildlife Trust (Schofield, HW., 2008).*
- *Bat Surveys for Professional Ecologists – Good Practice Guidelines (3rd edn.) (Collins, 2016)*
- *Bat Surveys for Professional Ecologists – Good Practice Guidelines (4th edn.) (Collins, 2023)*
- *Bat Roosts in Trees (Andrews, 2018)*
- *Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (NRA, 2006a)*
- CIEEM (2013) *Competencies for Species Surveys: Bats.* Chartered Institute of Ecology and Environmental Management, Winchester.
- *Guidelines for the Treatment of Bats during the Construction of National Road Schemes (NRA, 2006b)*
- *British Bat Calls: A Guide to Species Identification (Russ, 2012)*
- *Bat Mitigation Guidelines for Ireland – V2. Irish Wildlife Manuals, No. 134. (Marnell, Kelleher & Mullen 2022)*
- *UK Bat Mitigation Guidelines, (Reason, P. F. and Wray, S. 2023)*
- *Guidance Note 08/23: Bats and Artificial Lighting at Night (ILP, 2023)*

Map Legend

- SIte Location
- Markievicz Bridge Boundary
- Extent of dewatered area
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Garavogue River
- WFD Sub-Catchment
- WFD Catchment

Drawing Title

Site Location

Project Title

Markievicz Bridge Scour Repairs

Drawn By	Checked By
EF	PR
Project No.	Drawing No.
220943	Figure 1-1
Scale	Date
1:50,000	26/03/2025

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1.2 Policy and Legislation

All Irish bats are protected under European legislation, namely the Habitats Directive (92/43/EEC). All Irish species are listed under Annex IV of the Directive, requiring strict protection for individuals, their breeding sites and resting places. The Lesser horseshoe bat (*Rhinolophus hipposideros*) is further listed under Annex II of the Directive, requiring the designation of conservation areas for the species. Under this Directive, Ireland is obliged to maintain the favourable conservation status of Annex-listed species. This Directive has been transposed into Irish law through the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011).

In addition, Irish species are further protected by national legislation (Wildlife Acts 1976, as amended). Under this legislation, it is an offence to intentionally disturb, injure or kill a bat or disturb its roost. Any work at a roost site must be carried out with the agreement of the National Parks and Wildlife Service (NPWS) and a derogation licence must be granted before works commence.

The NPWS monitors the conservation status of European protected habitats and species and reports their findings to the European Commission every 6 years in the form of an Article 17 Report. The most recent report for the Republic of Ireland was submitted in 2019. Table 1-1 summarises the current conservation status of Irish bat species and identified threats to Irish bat populations.

Table 1-1 Irish Bat Species Conservation Status and Threats (NPWS, 2019)

Bat Species	Conservation Status	Principal Threats
Common pipistrelle *Pipistrellus pipistrellus*	Favourable	**A05** Removal of small landscape features for agricultural land parcel consolidation (M) **A14** Livestock farming (without grazing) [impact of anti-helminthic dosing on dung fauna] (M) **B09** Clear--cutting, removal of all trees (M) **F01** Conversion from other land uses to housing, settlement or recreational areas (M) **F02** Construction or modification (e.g. of housing and settlements) in existing urban or recreational areas (M) **F24** Residential or recreational activities and structures generating noise, light, heat or other forms of pollution (M) **H08** Other human intrusions and disturbance not mentioned above (Dumping, accidental and deliberate disturbance of bat roosts (e.g. caving) (M) **L06** Interspecific relations (competition, predation, parasitism, pathogens) (M) **M08** Flooding (natural processes) **D01** Wind, wave and tidal power, including infrastructure (M)
Soprano pipistrelle *Pipistrellus pygmaeus*	Favourable	
Nathusius' pipistrelle *Pipistrellus nathusii*	Unknown	
Leisler's bat *Nyctalus leisleri*	Favourable	
Daubenton's bat *Myotis daubentoni*	Favourable	
Natterer's bat *Myotis nattereri*	Favourable	
Whiskered bat *Myotis mystacinus*	Favourable	
Brown long-eared bat *Plecotus auritus*	Favourable	
Lesser horseshoe bat *Rhinolophus hipposideros*	Inadequate	

1.3 Bat Roosting Behaviour

Bats use a variety of natural and manmade structures as roosting or resting places. The type of roost and its level of use is determined by its function in the bat life cycle. Table 1-2 provides a summary of different types of bat roosts (Collins, 2023).

Table 1-2 Bat Roost Types and Definitions

Roost Type	Definition
Day	Where individuals or small groups, rest/shelter in the day but are rarely found by night in summer.
Night	Where bats rest/shelter at night but are rarely found in the day.
Feeding	Where individuals, or a few individuals, rest/feed for short periods during the night but are not present by day.
Transitional	Used by a few individuals for short periods of time prior to or following hibernation.
Maternity	Where females give birth and raise their young.
Hibernation	Where bats are found during winter (constant cool temperature and high humidity).
Satellite	An alternative roost found in close proximity to the main nursery colony used throughout the breeding season.
Swarming Site	Where large numbers gather in late summer to autumn. Important mating sites. Roosting may occur alongside swarming.
Mating Site	Where mating takes place in late summer to winter.

The likelihood of detecting active roosts is determined by the timing of the roost survey. In general:

- April surveys may detect transitional roosts used by bats following hibernation and prior to summer roosting.
- May-August surveys may detect maternity colonies and male/non-breeding female summer roosts.
- August surveys are best to determine maximum counts of adult and juvenile bats.
- August – October surveys may detect swarming and mating bats.
- September and October surveys may detect transitional roosts used by bats following the dispersal of maternity colonies and prior to hibernation.
- Day, night, feeding and satellite roosts may be found anytime between April and October.
- November – March surveys may detect hibernacula.

1.3.1 Bat Roost Significance

Whilst there are no clear Irish guidelines on assessing the significance of a roost, significance should be assessed at an appropriate spatial scale, based on species distribution, conservation status, current population trends, functionality of the site and the Zone of Influence (ZoI) of the project in question as it relates to bats (Reason and Wray, 2023). The significance of a bat roost is dependent on the rarity of the species using the roost and its function to the bat's life cycle, as outlined in Table 1-2 above. Table 3.2 of the CIEEM guidelines (adapted in Table 1-3) provides a starting point on the geographical assessment, which will rely on professional judgement and will be based on the baseline data collected and available information gathered during desktop studies.

Table 1-3 Roost importance at various geographic levels, adapted to Ireland from Table 3.2 of CIEEM guidelines (Reason and Wray, 2023)

Conservation status/ distribution	Individual or very small occasional/ transitional/ opportunistic roosts	Non-breeding day roosts (small numbers of species)	Mating sites, small numbers of hibernating bats	Larger transitional roosts	Hibernation sites	Autumn swarming sites	Maternity sites

Widespread all geographies	Site	Site	Site	Site/Local	Local/County [Larger hibernation sites rare in the UK]	Local/County [Very large pipistrelle swarming sites appear uncommon in the Ireland]	Unlikely to exceed Local/County importance unless colonies are atypically large; importance increased for assemblages.
Widespread in many geographies, but not as abundant in all	Site	Site	Site, dependent on local distribution [For *Myotis*, see swarming site column]	Local/County	Local/County importance dependent on size and number of species	County/National importance dependent on size; importance increased for larger sites that serve larger numbers/species	Unlikely to exceed County importance unless colonies are atypically large; importance increased for assemblages.
Rarer or restricted distribution	Site (very well-used night roosts may be of County importance for some species)	Site/Local/County, dependent on local distribution	Site/Local/County dependent on local distribution	Local/County	Local/County importance dependent on size and local distribution; increased value for assemblages.	County/National importance on size and local distribution; increased value for assemblages.	County/National importance on size and local distribution; increased value for assemblages.
Rarest Annex II species and very rare	Site (very well-used night roosts may be of Local/County importance for some species)	Site/Local/County, dependent on local distribution	Site/ Local/County, dependent on local distribution	Local/County	County/Regional importance on size and local distribution; increased value for assemblages	County/National importance on size and local distribution; increased value for assemblages.	County/National importance on size and local distribution; increased value for assemblages

All the largest roosts of Lesser Horseshoe Bat (LHB) in Ireland are of international importance and it is anticipated that all large Leisler's bat roosts (>100) would also have international significance (NRA, 2006) due to the limited distribution of this species in other European countries. Table 1-4 provides some criteria for determining the significance of different building roosts, as determined by the Bat Expert Panel of the Heritage Council in 2003 (NRA, 2006). Geographic criteria will be applied to these values.

Table 1-4 Level of Importance of Various Roosts in Ireland

Species	Indicator	Significance
Lesser horseshoe bat	Special Area of Conservation	Very significant
	If present	Significant
Whiskered bat	>10	Very significant
	If present	Significant
Natterer's bat	>10	Very significant
	If present	Significant
Daubenton's bat	Maternity roost	Significant
Leisler's bat	Maternity roost	Significant
Common pipistrelle	Maternity roost	Significant
Soprano pipistrelle	Maternity roost	Significant
Brown long-eared bat	Maternity roost	Significant

1.4 Statement of Authority

MKO employs a dedicated bat unit within its Ecology team who scope, carry out, and report on bat surveys, as well as producing impact assessments in relation to bats. MKO ecologists have relevant academic qualifications and are qualified in undertaking surveys to the levels required. MKO's Ecology team holds an open bat derogation licence from NPWS. The licence is intended for professionals carrying out surveys with the potential to disturb roosting bats (i.e. roost inspections). Graduate and seasonal ecologist staff are also covered under the licence under condition of being accompanied by more experienced colleagues.

Survey scoping was prepared by Sara Fissolo. The manual surveys were carried out by David Culleton, Laura McEntegert, Nora Szijarto, Frederick Mosley, Cuan Feeney and Cormac Roberts. Data manual ID was carried out by David Culleton. This report was prepared by David Culleton, was reviewed by Sara Fissolo, and was approved by Aoife Joyce. Staff's roles and relevant training are presented in Table 1-5 below.

Table 1-5 Project team qualifications and training.

Staff	Role	Qualifications and Training
Aoife Joyce (B.Sc., M.Sc.)	Project Director	B.Sc. (Hons) Environmental Science, University of Galway, Ireland. M.Sc. (Hons) Agribioscience, University of Galway, Ireland. Advanced Bat Survey Techniques – Trapping, biometrics, handling (BCI), Bat Impacts and Mitigation (CIEEM), Bat Tree Roost Identification and Endoscope Training (BCI), Bats in Heritage Structures (BCI), Bats and Lighting (BCI).
Sara Fissolo (B.Sc.)	Project Ecologist	B.Sc. (Hons) Ecology and Environmental Biology, University College Cork, Ireland. Advanced Bat Survey Techniques (BCI), Bat Impacts and Mitigation (CIEEM), Bats in Heritage Structures (BCI), Bat Care (BCT), Bats and Lighting (BCI), Kaleidoscope Pro Analysis (Wildlife Acoustics).
David Culleton (B.Sc., M.Sc.)	Bat Ecologist	B.Sc. (Hons) Zoology, University College Cork, Ireland. M.Sc. (Hons) Conservation Behaviour, Atlantic Technological University, Galway, Ireland. Bat Detector and Survey Training (BCI), Kaleidoscope Pro Analysis (Wildlife Acoustics), Endoscope Training (Internal), Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal).
Laura McEntegert (B.Sc.)	Ecologist	B.Sc. (Hons) Botany and Plant Science, National university of Ireland, Galway Bat Handling Training Course (BCI), Bats: Assessing the Impact of Development on Bats, Mitigation & Enhancement - (CIEEM), Kaleidoscope Pro Analysis (Wildlife Acoustics). Endoscope Training (Internal), Emergence and Re-Entry Surveys (Internal) Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal).
Nora Szijarto (B.Sc., M.Sc.)	Bat Ecologist	B.Sc. Biology, University of Lausanne, Switzerland M.Sc. Behaviour, Evolution and Conservation, University of Lausanne, Switzerland Bat Detector and Survey Training (BCI), Kaleidoscope Pro Analysis (Wildlife acoustics), Endoscope Training

		(Internal), Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal).
Frederick Mosley (B.A., M.Sc.)	Seasonal Bat Ecologist	B.A. (Hons) Biological and Biomedical Science Mod. Zoology, Trinity College, Dublin (2022) M.Sc. Marine Biology, University College Cork (2023) Kaleidoscope Pro Analysis (Wildlife Acoustics), Endoscope Training (Internal), Structure and Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal)
Cormac Roberts	Student Bat Ecologist	
Cuan Feely (B.Sc.)	Graduate Ecologist	BSc. (Hons) Environmental Science, University of Galway. Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal).

2. METHODOLOGY

2.1 Desktop Study

A desktop review of published material was undertaken to inform all subsequent field studies and assessments. The aim of the desktop review was to identify the presence of species of interest within the site and surrounding region.

The following list describes the sources of data consulted:

- *Review of online web-mappers: National Parks and Wildlife Service (NPWS) mapping.*
- *Review of NPWS Article 17 Report.*
- *Review of the publicly available National Biodiversity Data Centre web-mapper.*
- *Sligo County Development Plan 2024-2030.*
- *BCI Database.*
- *Review of NPWS Lesser Horseshoe Bat national dataset.*
- *Published reports.*

A number of published reports of surveys completed on bridges around Ireland were reviewed for references to Markievicz bridge (Shiel, C. 1999, Smiddy, P. 1991).

2.1.1 Bat Species' Range

EU member states are obliged to monitor the conservation status of natural habitats and species listed in the Annexes of the Habitats Directive. Under Article 17, they are required to report to the European Commission every six years. In April 2019, Ireland submitted the third assessment of conservation status for Annex-listed habitats and species, including all species of bats (NPWS, 2019).

The 2019 Article 17 Reports were reviewed for information on bat species' range and distribution in relation to the location of the Proposed Works.

2.1.2 National Bat Database of Ireland

The National Bat Database of Ireland holds records of bat observations received and maintained by Bat Conservation Ireland. These records include results of national monitoring schemes, roost records as well as ad-hoc observations. The database was searched for bat presence and roost records within a 10km radius of the proposed site, as well as general landscape suitability for bats.

2.1.3 Designated Sites

The potential for the proposed works to impact on sites that are designated for nature conservation is considered in separate Ecological Impact Assessment (EcIA) and Appropriate Assessment Screening (AASR) reports. Special Areas of Conservation (SACs) are designated under EU Habitats Directive. The European Sites that are within the Zone of Likely Impact, with bats identified as Qualifying Interests, are listed in Section 3.1.3 below.

Natural Heritage Areas (NHAs) are designated under the Wildlife (Amendment) Act 2000 and their management and protection is provided for by this legislation and planning policy. Proposed Natural Heritage Areas (pNHAs) were designated on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. Any identified NHAs and pNHAs designated for the protection of bats are presented in Section 3.1.3 and potential for impacts was fully considered.

2.1.4 Habitat and Landscape

2.1.4.1 Ordnance Survey Mapping

Ordnance survey maps (OSI 1:5,000 and 1: 50,000) and aerial imagery (ortho-based maps) were reviewed to identify any habitats and features likely to be used by bats. Maps and images of the site and general landscape were examined for suitable foraging, commuting or roosting habitats including woodlands and forestry, hedgerows, tree lines and watercourses.

2.1.4.2 Geological Survey Ireland

The Geological Survey Ireland (GSI) online mapping tool and University of Bristol Spelaeological Society (UBSS) Cave Database for the Republic of Ireland were consulted for any indication of natural subterranean bat sites, such as caves, within 10km of the proposed site (BCI, 2012) (last searched on the 08/10/2024). Furthermore, the archaeological database of national monuments was reviewed for any evidence of manmade underground structures, e.g. souterrains, that may be used by bats (last searched on the 8th October 2024).

2.1.4.3 National Monuments

The archaeological database of national monuments was reviewed for any evidence of manmade underground structures, e.g. souterrains, that may be used by bats (last searched on the 08/10/2024).

2.2 Field Study

2.2.1 Bat Habitat Appraisal

A walkover survey of the Study Area was carried out during daylight hours on the 17th September 2024. The landscape features on the site were visually assessed for potential use as bat roosting habitats and commuting/foraging habitats using a protocol set out in BCT *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (4th edn.) (Collins, 2023). The aim of the survey was to determine the presence of roosting bats within the proposed site.

Table 4.1 of the 2023 BCT Guidelines identifies a grading protocol for assessing structures, as well as commuting/foraging habitat for bats, which is summarised in Table 2-1. The protocol is divided into five Suitability Categories: *High, Moderate, Low*, *Negligible and None*.

Table 2-1 BCT protocol for bat habitat appraisals (Collins, 2023)

Assessment	Rationale
High	Structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions, and surrounding habitat. Continuous, high-quality, well-connected habitats, connected to known roosts.
Moderate	A structure used by bats due to their size, shelter, protection, conditions and surrounding habitat, but are unlikely to support a roost of high conservation status, and suitable, connected habitats.

Low	Structures with one or more potential roost sites that could be used by an individual bat opportunistically, and suitable but isolated habitats that could be used by a small number of bats.
Negligible	No obvious features present, but a level of uncertainty remains.
None	No habitat features likely to be used by roosting, foraging or commuting bats.

2.2.1.1 Preliminary Roost Assessment

A search for roosts was undertaken within the boundary of the Proposed Works site by three licenced ecologists to identify any potential roost features (PRFs).

The site was visited in September 2024. The bridge, including the underside of the bridge arches, was assessed from the riverbank with the aid of torches, a thermal camera and binoculars, for its potential to support roosting bats and searched for potential access points into the structure.

2.3 Bat Activity Surveys

2.3.1 Manual Surveys

Manual activity surveys included roost surveys of the bridge. For each of the surveys, surveyors were equipped with active full spectrum bat detectors, Batlogger M (Elekon AG, Lucerne, Switzerland). Surveys commenced 15 minutes before sunset, and continued until two hours after sunset. Where possible, species identification was made in the field and any other relevant information was also noted, e.g., numbers, behaviour, features used, etc. All bat echolocation was recorded for subsequent analysis to confirm species identifications, as detailed in Section 2.4. The survey effort is summarised in Table 2-2.

Table 2-2 Bat Activity survey effort

Date	Surveyors	Type	Sunrise/ Sunset	Weather
17/09/2024	David Culleton, Cormac Roberts, Laura McEntegert and Nora Szijarto	Dusk Emergence	19:44	16-22°C, Dry, Calm
01/10/2024	Laura McEntegert, Frederick Moseley, Cormac Roberts and Cuan Feely	Dusk Emergence	19:09	13-16°C, Dry, Calm

2.3.1.1 Roost Surveys

The bridge was identified during the bat habitat appraisal as having potential to host roosting bats was subject to presence/absence surveys in the form of emergence surveys. Rationale for survey effort was based on guidelines proposed by Collins in Tables 7.1 and 7.2 (Collins, 2023).

Surveyors were located at various locations around the structure (Locations 1, 2, 3 and 4) with a focus on potential access point and roosting features identified during the daylight walkover surveys. The purpose was to identify any bat species, numbers, access points and roosting locations within each the PRF structure. Night vision aids (NVAs), including a thermal camera, aided the survey effort. Surveyor locations are presented in Figure 2-1.

Surveys were carried out in favourable weather conditions. Roost emergence surveys commenced 15 minutes before sunset and concluded between 1.5 and 2 hours after sunset.

2.3.1.2 Night Vision Aids

The use of NVAs is now considered standard best practice for bat activity surveys. MKO employs thermal camera equipment. The thermal cameras (InfiRay Eye II V2.0 and Pixfra RANGER R625), mounted on a tripod, was used during the roost survey to identify potential roosting hotspots and monitor emergence activity. The camera was fully monitored by a surveyor, who was equipped with a bat detector to record bat echolocation calls.

Footage from NVAs was saved and reviewed in office in full, with any instances of emergence marked for future use. The location of the NVAs is presented in Figure 2-1.

2.4 Bat Call Analysis

All recordings were later analysed using bat call analysis software Kaleidoscope Pro v.5.6.8 (Wildlife Acoustics, MA, USA). The aim of this was to identify, to a species or genus level, what bats were present at the Proposed Works site. Bat species were identified using established call parameters, to create site-specific custom classifiers. All identified calls were also manually verified.

Echolocation signal characteristics (including signal shape, peak frequency of maximum energy, signal slope, pulse duration, start frequency, end frequency, pulse bandwidth, inter-pulse interval and power spectra) were compared to published signal characteristics for local bat species (Russ, 1999). *Myotis* species (potentially Daubenton's bat *(M. daubentonii),* Whiskered bat *(M. mystacinus),* Natterer's bat *(M. nattereri)*) were considered as a single group, due to the difficulty in distinguishing them based on echolocation parameters alone (Russ, 1999). The echolocation of Soprano pipistrelle *(P. pygmaeus)* and Common pipistrelle *(P. pipistrellus)* are distinguished by having distinct (peak frequency of maximum energy in search flight) peak frequencies of ~55 kHz and ~46 kHz respectively (Jones & van Parijs, 1993). Some overlapping is possible between these species: where no certainty could be achieved, calls were identified to genus level.

Individual bats of the same species cannot be distinguished by their echolocation alone. Thus, 'bat passes' was used as a measure of activity (Collins, 2023). A bat pass was defined as a recording of an individual species/species group's echolocation containing at least two echolocation pulses and of maximum 15s duration. All bat passes recorded in the course of this study follow these criteria, allowing comparison. Due to the volume of bat activity data recorded, where multiple bat passes were recorded within the same registration, rarer or harder to record species were identified. Underreporting of common species is possible using this method, and is accounted for within the assessment.

Echolocation calls by Brown long-eared bats (*Plecotus auritus*) are intrinsically quiet and hard to record by static equipment. All data collected, including Noise files and Auto ID files are checked to ensure all calls for this species have been captured. However, a level of underrepresentation is expected for this species and is accounted for in the assessment of activity levels.

Map Legend

- Markievicz Bridge Boundary
- Surveyor Locations

NVA Locations

- 01/10
- 17/09

N

Drawing Title

2024 Survey Effort

Project Title

Markievicz Bridge Scour Repairs

Drawn By	Checked By
DC	SF
Project No.	Drawing No.
220943	2-1
Scale	Date
1:1,000	08.10.2024

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3. RESULTS

3.1 Desktop Study

No references to Markievicz Bridge was found within the reviewed published material.

3.1.1 Sligo Co. Development Plan (2024-2030)

The Sligo County Development Plan (2024-2030) was searched for references specific to the protection of bats. The following objective was found:

24.1.2 Protecting biodiversity – non-designated sites
Protected Species

Certain plant, animal and bird species are protected by law. This includes plant species listed in the Flora Protection Order 1999 and animals and birds listed in the Wildlife Act 1976 and subsequent statutory instruments, those listed in Annex IV of the Habitats Directive (92/43/EEC), and those listed in Annex I of the Birds Directive (2009/147/EC). Proposals for developments, where appropriate, will require an assessment of the presence of bats and other protected species, and must ensure that suitable avoidance and/or mitigation measures are put in place accordingly.

Protected species – policies*: It is the policy of Sligo County Council to:*

P-PS-1 *Ensure that development does not have a significant adverse impact incapable of satisfactory mitigation on plant, animal or bird species protected by law.*

P-PS-2 *Consult with the National Parks and Wildlife Service (DHLGH) and take account of any licensing requirements when undertaking, approving, and authorising development which is likely to affect plant, animal or bird species protected by law.*

P-PS-3 *Provide guidance to developers and others in relation to species protected by law and their protection and management in the context of development.*

P-PS-4 *Ensure, where appropriate, the protection and conservation of areas, sites, species and ecological networks of biodiversity value outside designated sites, and require an appropriate level of ecological assessment by suitably qualified professionals to accompany any development proposals likely to impact on such areas or species.*

P-PS-5 *Require all new developments to incorporate habitat facilities for wildlife species, including Swifts, in or on buildings or their facades, where appropriate.*

Protected species – objective: *It is an objective of Sligo County Council to:*

O-PS-1 *Undertake surveys, as appropriate, to establish the location of protected flora and fauna in the Plan area through the County Heritage Plan and the County Biodiversity Action Plan.*

3.1.2 National Biodiversity Data Centre

A review of the National Bat Database of Ireland on the 178 yielded results of bats within a 10km hectad of the proposed works. The search yielded 6 bat species within 10km. Table 3-1 lists the bat species recorded within the hectad which pertains to the proposed works site (G63).

A review of the NBDC bat landscape map provided a habitat suitability index of 36.11 (red). This indicates that the Proposed Works area has high habitat suitability for bat species.

Table 3-1 NBDC Bat Records

Hectad	Species	Date	Database	Status
G63	Brown Long-eared Bat (*Plecotus auritus*)	31/12/2009	National Bat Database of Ireland	Annex IV
G63	Common Pipistrelle (*Pipistrellus pipistrellus sensu stricto*)	26/05/2018	National Bat Database of Ireland	Annex IV
G63	Daubenton's Bat (*Myotis daubentonii*)	31/08/2021	National Bat Database of Ireland	Annex IV
G63	Lesser Noctule (*Nyctalus leisleri*)	26/05/2018	National Bat Database of Ireland	Annex IV
G63	Natterer's Bat (*Myotis nattereri*)	31/12/2009	National Bat Database of Ireland	Annex IV
G63	Pipistrelle (*Pipistrellus pipistrellus sensu lato*)	31/12/2009	National Bat Database of Ireland	Annex IV
G63	Soprano Pipistrelle (*Pipistrellus pygmaeus*)	26/05/2018	National Bat Database of Ireland	Annex IV

3.1.3 Designated Sites

Within Ireland, the Lesser horseshoe bat is the only bat species requiring the designation of Special Areas of Conservation (SACs). The site is situated outside the current known range for this species.

No proposed Natural Heritage Area (pNHA) designated for the protection of bats were identified within 10km of the proposed works.

3.1.4 Habitat and Landscape

A review of the GSI online mapper did not indicate the possible presence of any subterranean sites within the Proposed Works site and a search of the National Monuments Database did not reveal the presence of any manmade subterranean sites within the site.

A search of the UBSS Cave Database for the Republic of Ireland found thirteen caves within 10 km of the proposed site (Table 3-2).

No national monuments are reported within the site.

Table 3-2 Caves within 10km of the proposed site.

Cave	Distance to Site	Description
Tonapubble	1.9km	24m long rift
Tully Cave	6.3km	
Deerpark Cave	5.8km	2 caves, one is 12m long
Sramore Cave	9.0km	20m crawl
Finn McCool's Pot	9.3km	25m deep, 138m long

Lily's Hole	9.5km	Large chamber 15m long, 2 entrances
Knocknarea Cave 1	7.5km	20m of intersecting tunnels
Knocknarea Cave 2	7.6km	4 small caves, longest is 15m
Knocknarea Cave 3	7.7km	System of tunnels and rifts 50m in total
Knocknarea Cave 4	7.8km	Tunnel 30m long
Knocknarea Cave 5	7.6km	5m long high cleft
Knocknarea Cave 6	7.6km	30m long rift
Knocknarea Cave 7	7.4km	15m network of rifts

3.2 Bat Habitat Appraisal

A detailed description of the habitats located within the Proposed Works site are presented in the accompanying Ecological Impact Assessment (EcIA). A bat walkover and inspection survey were conducted on the 17th of September 2024. During this survey, habitats within the study area were assessed for their suitability for bats to roost, forage and commute. Connectivity with the wider landscape was also considered to determine habitat suitability.

With regard to foraging and commuting bats, the proposed works site and river are considered of *Moderate* suitability due to the lack of street lighting present and good linear connectivity to the surrounding habitats. However, the presence of scrub at the northern border of the river to the east and west provide some foraging opportunities, and connectivity to the wider landscape. Urban areas, which surround the bridge, are considered of *Low* suitability.

Details of the assessment of Markievicz bridge for its suitability to host roosting bats are presented below.

3.2.1 Preliminary Roost Assessment

Markievicz Bridge is a stone bridge located in the centre of Sligo town (IG Ref: G 69329 35946) (Plate 3-1 and 3-2). Despite the urban area, the bridge is located in proximity to quality foraging habitat to the east and the west and multiple potential access points were identified and therefore, Markievicz Bridge was assigned a *Moderate* roosting potential. The bridge was subject to dusk emergence surveys on the 17th September and the 1st October 2024, as detailed in Section 3.3.1.1.

Plate 3-1 Markievicz Bridge; Western aspect

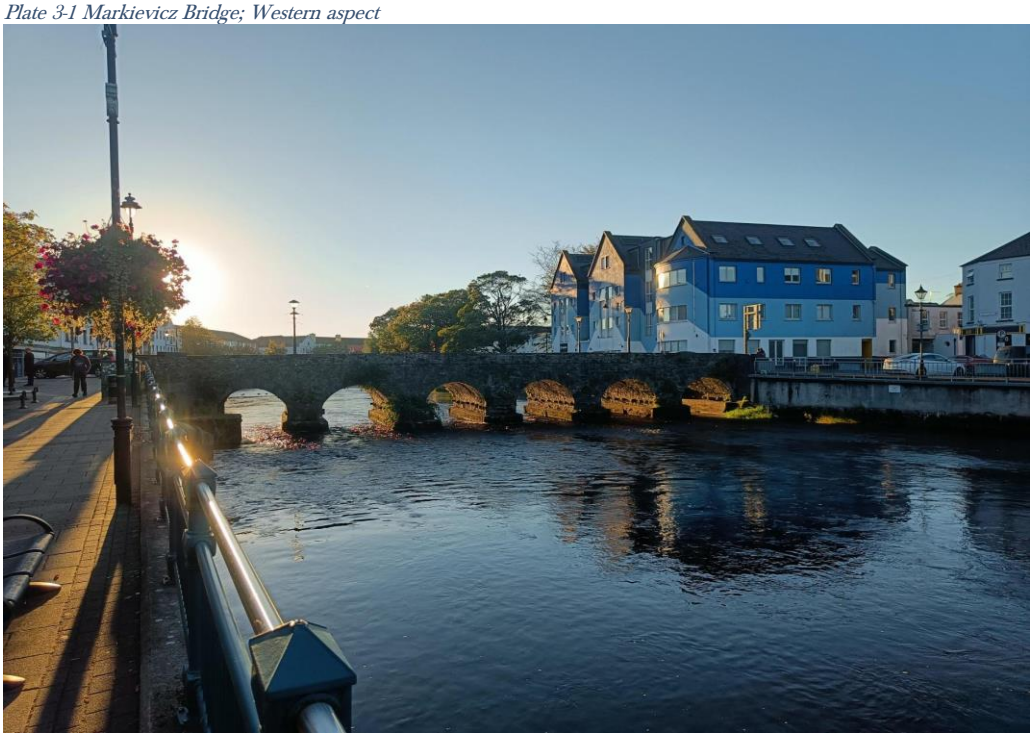

Plate 3-2 Markievicz Bridge; Eastern aspect

3.3 Bat Activity Surveys

3.3.1.1 Dusk Emergence Surveys

Two dusk emergence survey were carried out by four surveyors at Markievicz Bridge. Bat activity was recorded during both surveys. Surveys were carried out in suitable weather conditions and commenced 15 minutes before sunset, and concluded approximately 2 hours after sunset.

During the survey on the 17th September 2024, six Soprano pipistrelles were observed emerging from the stonework beneath the second to northernmost arch under the bridge (Plate 3-3). Soprano pipistrelle was the most recorded species during this survey (n=665), followed by Common pipistrelle (n=134) and, to a lesser extent, Leisler's bat (n=25). Soprano and Common pipistrelles were observed foraging under the two northernmost arches of the bridge. A small number of Leisler's bats were recorded commuting during the manual survey.

No bats were observed emerging from the bridge during the survey on the 1st October 2024. Higher Soprano pipistrelle activity (n=1060) was recorded during this survey. Instances of Common pipistrelle (n=120) were less than that recorded during the survey on the 17th September. Foraging and social behaviours were observed at the two northernmost arches of the bridge. No Leisler's bats were recorded. Table 3-3 shows the species passes recorded during each survey. Surveyor locations are presented in Figure 2-1.

Table 3-3 Manual Survey Species passes

Date	Surveyor	Leiser's bat	Common pipistrelle	Soprano pipistrelle
17/09/2024	1	10	57	264
	2	13	74	303
	3	1	3	91
	4	1		7
01/10/2024	1		4	288
	2		7	284
	3		60	346
	4		49	142

Plate 3-3 Emergence location in the northern aspect of the second to northernmost arch.

4. DATA EVALUATION

4.1.1 Discussion and Interpretation

Markievicz Bridge is located within the known range of seven species of Irish bats. Bats were recorded in the vicinity of the bridge during each manual survey. Soprano pipistrelle activity was higher than any other species during the surveys. Leisler's bat was recorded only during the first manual survey. Soprano pipistrelles were observed consistently foraging and socialising at the two northernmost arches during both surveys. The northern section of the bridge is well connected to foraging habitats to the east and west and the majority of bat activity during the manual surveys was observed at the two northernmost arches. No bats were observed emerging from either side of the bridge and it is likely that there are no roosts present there. However, a Soprano pipistrelle roost was identified under the second-to-northmost arch of the bridge. Six bats were observed emerging from the structure during the September survey, and no bats emerged during the October survey. The roost is likely a small day roost or a small maternity roost (Reason & Wray, 2023) and, therefore, is likely of local importance. The roost not likely to be a hibernation roost.

Overall, bat activity was moderate around the bridge and only synanthropic bats were recorded during the surveys. A bat roost was confirmed during the surveys and quality habitats to the east and west provide foraging opportunities for roosting bats.

4.1.2 Importance of Bat Population Recorded at the Site

Ecological evaluation within this section follows a methodology that is set out in Chapter three of the '*Guidelines for Assessment of Ecological Impacts of National Roads Schemes'* (NRA, 2009).

All bat species in Ireland are protected under the Bonn Convention (1992), Bern Convention (1982) and the EU Habitats Directive (92/43/EEC). Additionally, in Ireland bat species are afforded further protection under the Birds and Natural Habitats Regulations (2011) and the Wildlife Acts 1976 (as amended). Bats as an Ecological Receptor have been assigned ***Local Importance (Higher value)*** on the basis that the habitats within the study area are utilized by a regularly occurring bat population of Local Importance.

2024 surveys confirmed that bats are currently using Markievicz Bridge to roost. No evidence of large roosts was found during the surveys. However, on a precautionary basis, as the bridge was surveyed in Autumn only it cannot be ruled out that the roost found is a maternity roost, and therefore it should be considered as such.

4.1.3 Survey limitations

A comprehensive suite of bat surveys were undertaken at the Proposed Works site. The surveys undertaken in accordance with BCT Guidance, provide the information necessary to allow a complete, comprehensive and robust assessment of the potential impacts of the Proposed Works on bats receptors.

Access limitations can relate to roost inspections:

- Due to high water levels and the fast-flowing river, it was not possible to inspect the sides of the bridge, or underneath the arches. However, a second manual survey was undertaken to provide a robust assessment of the bridge.

Survey limitations can relate to deployment coverage, data storage, equipment failure or deployment-related incidents:

- Good survey coverage of the site has been achieved, with four surveyors providing full coverage of the bridge during both manual surveys.
- MKO employs data storage redundancy methods to ensure no data is lost from the field to final analysis - no data was lost.
- SD card corruption or fill-up can prevent data from being collected during deployments – no issues with data on-site data storage were encountered.
- Bat detector's microphones are checked before every season to ensure they have good sensitivity for data collection, and detectors' software updates are installed as soon as they become available - no issues related to equipment were encountered during the surveys.
- Incidents during deployments, such as tampering or livestock interference, can prevent data from being collected effectively - no incidents were reported during the surveys.

Activity assessment limitations can relate to data analysis procedures and a lack of standardised and Ireland-based assessment methods:

- MKO's data analysis methods include manually checking of 100% of bat passes identified by Auto ID Software, as well as noise and no ID files. Where multiple species, or multiple individuals of the same species, are identified within the same call, only one is reported, prioritising hard to detect species. This is due to the large volumes of data collected. While this method is likely to introduce a bias, it is not believed to affect the overall conclusions of the assessment, as only commonly recorded species might be underreported.
- No activity threshold currently exists for Irish bat species to objectively assess bat activity within a certain habitat, and no standardised assessment method has been proposed across the country. Ecobat software recommended by existing guidelines was not available for use at the time of the assessment, as under maintenance. MKO experience surveying habitats similar to those present within the site aided with the assessment.

No significant limitations in the scope, scale or context of the assessment have been identified.

5. CONCLUSION & RECOMMENDATIONS

The following points set out the main conclusions following the completion of the surveys described above:

- Three bat species were recorded commuting and foraging across the proposed works site during the bat surveys carried out in September and October 2024, including Soprano pipistrelle, Common pipistrelle and Leisler's bat.
- The existing landscape occurring within the site provides moderate habitats for commuting and foraging bats.
- One active roost was recorded.

A full assessment of the potential impacts on bats as a result of the Proposed Works is presented in the EcIA which will accompany the planning application. Consideration should be given to the following measures to mitigate for potential impacts:

- Any proposed works will avoid the confirmed roost during steaming/abrasive cleaning and mortar joint repointing. A derogation licence from NPWS will be required in the event that the roost location cannot be retained.
- A derogation licence to disturb bats is required should works be undertaken during the bat activity season (April–October). This licence was obtained from the NPWS on the 3rd March 2025.
- Works are proposed to be carried out between the months of July and September. However, should proposed works be undertaken outside of the activity season (November–March), a pre-commencement survey by a licenced ecologist will be completed to ensure no roosting bats are present.
- Should additional suitable roosting features be identified during the site supervision, they will be subject to an under arch inspection by the ecologist to ensure no roosting bats are present within. Suitable additional roosting spaces will be recommended for retention.
- If scaffolding is to be erected for an extended period during the bat activity season, there should be no obstructing of obstructing of commuting/foraging corridors.
- During the bat activity season, no lighting should be implemented under the bridge arches to minimise disturbance to roosting bats.

The surveys undertaken provide a good understanding of the use of the structure and surrounding habitats by bats and the report provides an overview with regard to the likely challenges faced and constraints associated with the proposed works.

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