

EIAR SCREENING ASSESSMENT

Remediation Project at Monasterevin Bridge

Kildare County Council

PROJECT NO. K424

JANUARY 2021



OCSC

O'CONNOR | SUTTON | CRONIN

Multidisciplinary
Consulting Engineers



EIAR SCREENING ASSESSMENT

Remediation Project at Monasterevin Bridge

Kildare County Council

PROJECT NO. K424

JANUARY 2021

EIAR SCREENING ASSESSMENT

Remediation Project at Monasterevin Bridge

for

Kildare County Council



OCSC

O'CONNOR | SUTTON | CRONIN

Multidisciplinary
Consulting Engineers

NOTICE

This document has been produced by O'Connor Sutton Cronin & Associates for its client Kildare County Council. It may not be used for any purpose other than that specified by any other person without the written permission of the authors.



DOCUMENT CONTROL & HISTORY

OCSC Job No.: K424	Project Code	Originator	Zone Volume	Level	File Type	Role Type	Number	Status / Suitability Code	Revision
	K424	OCSC	ZZ	ZZ	RP	YE	800	S2	P02
Rev.	Status	Authors	Checked	Authorised	Issue Date				
P02	S2	EB	EB	EB	07.01.2021				
P01	S2	RT	EB	EB	27.10.2020				

EIAR SCREENING ASSESSMENT

<u>TABLE OF CONTENTS</u>	<u>PAGE</u>
1 INTRODUCTION.....	1
1.1 Project Contractual Basis & Parties Involved	1
1.2 Study Area	1
1.3 Project Description	2
1.4 Project Objectives.....	3
1.5 Methodology and Approach	3
1.6 Scope of Works	4
1.7 Limitations	4
2 EIA SCREENING PROCESS	6
2.1 Introduction	6
2.2 EIA Applicable Legislation.....	6
2.3 Mandatory EIAR Review	6
3 CHARACTERISTICS OF PROPOSED DEVELOPMENT	9
3.1 Size and Design.....	9
3.2 Cumulation with other Existing Developments/Development the subject of a Consent	9
3.3 The nature of any associated Demolition Works	9

3.4	The use of Natural Resources, in particular Land, Soil, Water and Biodiversity	
		10
3.5	Production of Waste	10
3.6	Pollution and Nuisances	10
3.7	The Risk of major Accidents and/or Disasters including those caused by Climate Change	11
3.8	Risks to Human Health – e.g. Water Contamination/Air Pollution.....	11
4	LOCATION OF THE PROPOSED DEVELOPMENT	12
4.1	Information Sources	12
4.2	Abundance, Availability, Quality and Regenerative Capacity of Natural Resources	12
4.3	The Absorption Capacity of the Natural Environment	12
4.3.1	Surrounding Land Use	12
4.3.2	Site Development	13
4.3.3	Site Physical Setting.....	14
4.3.4	Hydrology	14
4.3.5	Biodiversity	16
4.3.6	Topography.....	19
4.3.7	Unconsolidated Geology.....	19
4.3.8	Geology	19
4.3.9	Area of Geological Interest.....	20
4.3.10	Aquifers	21
4.3.11	Groundwater Vulnerability	22
4.3.12	Groundwater Recharge.....	23
4.3.13	Wells & Springs.....	25
4.3.14	Protected Structures.....	27

5	TYPES AND CHARACTERISTICS OF POTENTIAL IMPACTS	29
5.1	Magnitude and Spatial Extent of Impact	29
5.2	The Nature of the Impact.....	29
5.3	The Transboundary Nature of the Impact	29
5.4	The Intensity and Complexity of the Impact	29
5.5	The Probability of the Impact.....	29
5.6	Expected Onset, Duration, Frequency and Reversibility of the Impact	30
5.7	The Cumulation of the Impact with the Impacts of other Existing and/or Future Developments	30
5.8	The Possibility of Effectively Reducing the Impact	30
5.9	Screening Decision.....	30

APPENDICES

APPENDIX A	NIS – Ecofact 2020
APPENDIX B	Biodiversity Assessment – Ecofact 2020
APPENDIX C	Architectural Heritage Impact Report

1 INTRODUCTION

1.1 Project Contractual Basis & Parties Involved

This report has been prepared by O'Connor Sutton Cronin & Associates Ltd. (OCSC) at the request of their Client, Kildare County Council. O'Connor Sutton Cronin (OCSC) were appointed by Kildare County Council to undertake a condition survey of Monasterevin Bridge. Following the condition survey OCSC undertook the design of the remediation works required for the structure. The survey identified that the proposed repair works consists of repointing of the parapets, relaying of the bridge surface, reconstruction of the riverbed under some of the arches, removal of vegetation from embankments and the inclusion of underpinning repairs to the upstream cutwaters of the R445 bridge crossing the River Barrow in Monasterevin, Co. Kildare.

The purpose of this report is to determine whether the project requires the preparation of an Environmental Impact Assessment Report (EIAR). This report documents the screening completed to provide a summarised overview of the potential impacts on the receiving environment whilst taking cognisance of the relevant statutory requirements.

The report was completed by Richard Thompson, Senior Geologist with OCSC. The report was reviewed and approved by Eleanor Burke who is the OCSC Environmental Division Manager. The Project Director is Brian Heron Chartered Engineer and Associate Director with OCSC.

1.2 Study Area

The site will encompass both sides of the River Barrow, which flows from North to South at that location. The remediation work itself will incorporate the embankments along both sides of the bridge, and in-stream and out-of-stream works on the walls of the bridge structure, as seen in Figure 1.1. The site is located is along the Road R445 and immediately east of the site is Road R424. The site consists of the River Barrow water course and the surrounding land use is agricultural, residential and industrial. The regional site location is illustrated in Figure 1.1.

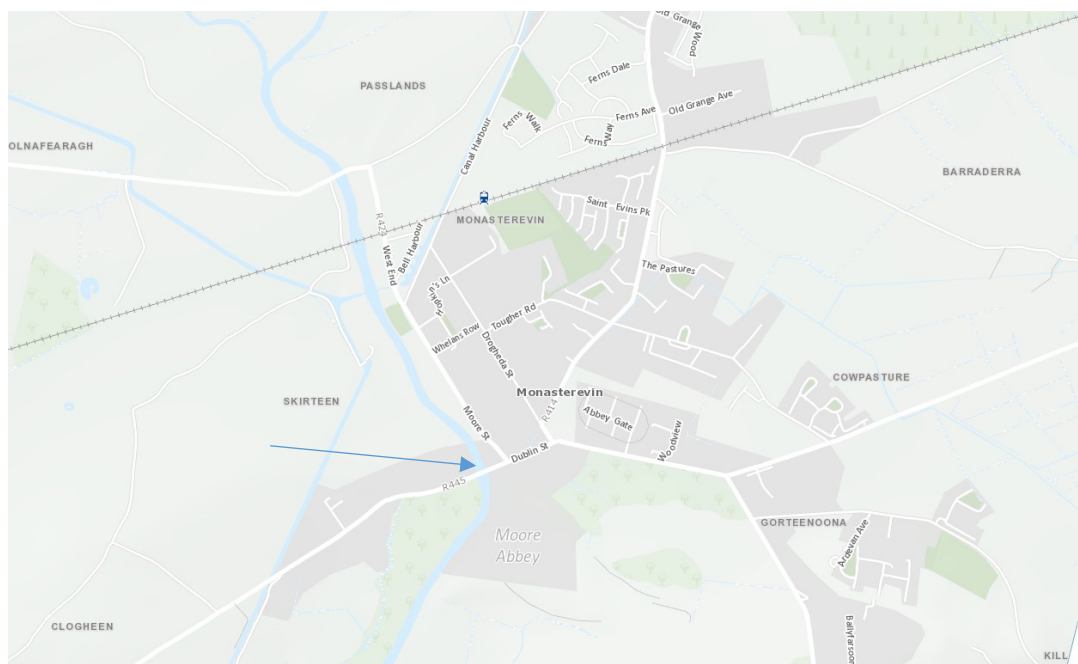


Figure 1.1 Regional Site Location (Source: Ordnance Survey of Ireland)

The site is approximately 0.10 hectares (ha) in area and the Ordnance Survey of Ireland (OSI) Easting Northing coordinates for the site are 662625, 710110.

1.3 Project Description

The purpose of this report is to determine whether the project requires the preparation of an Environmental Impact Assessment Report (EIAR). This report documents the screening completed to provide a summarised overview of the potential impacts on the receiving environment whilst taking cognisance of the relevant statutory requirements.

Following an appointment by Kildare County Council, OCSC undertook the design of the remediation works required for the structure. The survey identified that the proposed repair works consists of repointing of the parapets, relaying of the bridge surface, reconstruction of the riverbed under some of the arches, removal of vegetation from embankments and the inclusion of underpinning repairs to the upstream cutwaters of the R445 bridge crossing the River Barrow in Monasterevin, Co. Kildare.

Documents referred to as part of this assessment include:

- AA Screening Report for proposed bridge repair works, Scott Cawley 2019
- Monasterevin Bridge, Co. Kildare Natura Impact Statement Version 20th March 2020 Ecofact
- Remediation Methodology OCSC March 2020 (K424-OCSC-XX-XX-RP-C-0003)

The remedial works planned for this project, in relation to this EIAR include both instream and out of stream works including:

- Rock Armour Installation – along a 15m section

- Repair of Concrete Skirt that protects the piers including proposed scour protection and underpinning detail and reconstruction of the riverbed under some of the arches.
- De-vegetation and Repointing of Masonry
- Relaying of bridge surface.

An AA screening was required to be undertaken for the proposed remedial works to confirm if likely significant effects on European sites will arise from the proposed repair works either alone or in combination with other plans or projects and as to whether or not the proposed development is likely to have significant effects on European sites, either individually or in combination with other plans or projects.

For the reasons set out in detail in the AA Screening Report undertaken by Scott Cawley (reference date 08th May 2019), it was objectively concluded that an Appropriate Assessment of the proposed Project is required as it could not be concluded, on the basis of objective information, that the proposed Project, either individually or in combination with other plans or projects, will not have a significant effect on the following European site(s): River Barrow and River Nore SAC. As part of the Appropriate Assessment process OCSC engaged Ecofact to prepare a Natura Impact Statement (NIS). The summary of the NIS was that there would be no residual impacts.

1.4 Project Objectives

The overall project objectives include:

- a description of the physical characteristics of the whole project;
- a description of the location of the project, with particular regard to the environmental sensitivity of geographical areas likely to be affected;
- description of the aspects of the environment likely to be significantly affected by the project; and
- A description of any likely significant effects, to the extent of the information available on such effects, of the project on the environment resulting from: a) the expected residues and emissions and the production of waste, where relevant; b) the use of natural resources, in particular soil, land, water and biodiversity.

1.5 Methodology and Approach

The methodology and approach used in the preparation of this report will follow:

- Guidelines on the Information to be contained in Environmental Impact Assessment Reports, Irish Environmental Protection Agency, Draft Edition, August 2017.
- European Commission (2015) Environmental Impact Assessment – EIA, Over, Legal Context
- European Union EIA Directive (85/337/EEC) and its amendments in 1997, 2003 and 2009;

- Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment;
- Planning and Development Act 2000 (as amended);
- Planning and Development Regulations 2001 (as amended);
- Directive 2014/52/EU;
- Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licensing Systems – Key Issues Consultation Paper (2017; DoHPCLG);
- Preparation of guidance documents for the implementation of EIA directive (Directive 2011/92/EU as amended by 2014/52/EU) – Annex I to the Final Report (COWI, Milieu; April 2017)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018)
- Environmental Impact Assessment – Guidance for Consent Authorities regarding Sub-threshold Development (2003; DoEHLG)

Using the above documents it has been possible to carry out a desktop EIAR Screening using the best available guidance and operating within the applicable legislation. The methodology employed in this screening exercise updates previous guidance in line with the new Directive 2014/52/EU.

1.6 Scope of Works

To meet the project objectives the following scope of works were completed:

- Present a discussion of the current site status and key environmental influences around the site;
- Undertake and present a historical site and area review, primarily referring to old Ordinance Survey Ireland maps but utilising other sources as appropriate and readily available;
- Present a discussion of the general soil and groundwater conditions within the topographical and area context;
- Present an overview if any significant negative environmental impacts can arise from the proposed project.

1.7 Limitations

This Environmental Impact Assessment Screening Report has been prepared for the sole use of Kildare County Council (“the Client”). No other warranty, expressed or implied, is made as to the professional advice included in this report or any other services provided by OCSC.

This assessment is based on a review of available historical information, environmental records, consultations, relevant guidance information and reports from third parties. All information received has been taken in good faith as being true and representative.

This report has been prepared in line with best industry standards. The methodology adopted and the sources of information used by OCSC in providing its services are outlined in this

Report. The assessment undertaken by OCSC and described was undertaken in October 2020 and is based on the information available during that period. The scope of this Report and the services are accordingly factually limited by these circumstances.

OCSC disclaim any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to OCSC's attention after the date of the Report.

The conclusions presented in this report represent OCSC's best professional judgement based on review of the relevant information available at the time of writing. The opinions and conclusions presented are valid only to the extent that the information provided was accurate and complete.

The findings of the EIA screening assessment prepared for the project has informed our professional opinion as to whether an EIAR is warranted for the proposed project, with due regard to all relevant statutory requirements and technical guidance. However ultimately it is the responsibility of the relevant planning authority to make a determination as to whether an EIAR is required for a particular project, based on screening conducted by the planning authority.

2 EIA SCREENING PROCESS

2.1 Introduction

This section of the report discusses the legislative basis for screening so as to decide whether or not the proposed project requires an Environmental Impact Assessment Report (EIAR) to be prepared. It also sets out the project in terms of planning context.

This project has been screened in accordance with Section 3.2 of the 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports – Draft' (EPA, 2017), the Environmental Impact Directive (85/337/EEC) and all subsequent relevant amendments, Planning and Development regulations (2001-2018), including S.I. No. 296 of 2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, which came into operation on 1st September 2018.

2.2 EIA Applicable Legislation

Across the European Union, The Environmental Impact Assessment (EIA) Directive 85/337/EEC is in force since 1985 and applies to a wide range of defined public and private projects, which are defined in Annexes I (Mandatory EIA) and II (Screening-Discretion of Member States) of the directive. The EIA Directive of 1985 has been amended three times, 97/11/EC, 2003/35/EC and 2009/31/EC. These amended directives have been coded and replaced by Directive 2011/92/EU of the European Parliament and Council on the assessment of the effects of certain public and private projects on the environment (and as amended by Directive 2014/52/EU). Directive 2014/52/EU have been transposed in 2018 in Irish law under the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (SI 296 of 2018).

2.3 Mandatory EIAR Review

Annex I of the European Communities (EIA) Directive lists the activities for which a mandatory EIA is required. The proposed project is not listed in Annex I and hence it is not mandatory for an EIA to be carried out.

The proposed bridge remediation works are also not on the mandatory list of road projects requiring mandatory EIA as outlined in Section 50 of the Roads Act, 1993 (as amended) and in Article 8 of the Roads Regulations, 1994. The list of road projects requiring mandatory EIA is listed in Table 2.1.

Table 2.1 Roads Projects Requiring Mandatory EIA

Mandatory Threshold	Reference
Construction of a Motorway.	S. 50(1)(a) of the Roads Act, 1993, as substituted by S. 9(1)(d)(i) of the Roads Act, 2007
Construction of a Busway.	S. 50(1)(a) of the Roads Act, 1993, as substituted by S. 9(1)(d)(i) of the Roads Act, 2007
Construction of a Service Area.	S. 50(1)(a) of the Roads Act, 1993, as substituted by S. 9(1)(d)(i) of the Roads Act, 2007
<p>Prescribed type of proposed road development:</p> <ol style="list-style-type: none"> 1. The construction of a new road of four or more lanes, or the realignment or widening of an existing road so as to provide four or more lanes, where such new, realigned or widened road would be eight kilometres or more in length in a rural area, or 500 metres or more in length in an urban area. 2. The construction of a new bridge or tunnel which would be 100 metres or more in length. 	<p>Article 8 of the Roads Regulations, 1994</p> <p>(Road development prescribed for the purposes of S. 50(1)(a) of the Roads Act, 1993</p>

Annex II of the Directive lists the activities for which each member state is permitted to exercise discretion to decide whether an EIA is necessary. The proposed development plan is not listed specifically on Annex II. It is also not listed on the sub-threshold development in Road Act, 1993 (as amended), and the Roads Regulations, 1994.

Sub-threshold EIS (123A.) 2, of the Planning and Development Regulations 2001 – 2015.

(2) *Where a local authority proposes to carry out a sub-threshold development which would be located on or in –*

(a) *a European site,*

(b) *an area the subject of a notice under section 16 (2)(b) of the Wildlife (Amendment) Act, 2000 ,*

(c) *an area designated as a natural heritage area under section 18 of the Wildlife (Amendment) Act, 2000 ,*

the local authority concerned shall decide whether the development would or would not be likely to have significant effects on the environment of such site, area or land, as appropriate.

Where a project is listed on Annex II or is a development that is not exempted, the national authorities of the member state have to decide whether an EIA is needed for a proposed project. This is done by the "screening procedure", which determines the effects of projects on the basis of thresholds/criteria or a case by case examination. Annex III of the Directive outlines the specific criteria that must be taken into account when a sub-threshold project is being examined for Environmental Impact Assessment. The screening procedure investigates whether the project has significant negative impact on the environment using different criteria including:

- Characterisation of the proposed development
- Location of proposed development
- Type and Characteristics of the potential impact

The relevant information to be provided Information for the Purposes of Screening Sub-threshold Development for Environmental Impact Assessment include:

1. A description of the proposed development, including in particular—
 - (a) A description of the physical characteristics of the whole proposed development and, where relevant, of demolition works, and
 - (b) A description of the location of the proposed development, with particular regard to the environmental sensitivity of geographical areas likely to be affected. 120 [296]
2. A description of the aspects of the environment likely to be significantly affected by the proposed development.
3. A description of any likely significant effects, to the extent of the information available on such effects, of the proposed development on the environment resulting from—
 - (a) The expected residues and emissions and the production of waste, where relevant, and
 - (b) The use of natural resources, in particular soil, land, water and biodiversity.
4. The compilation of the information at paragraphs 1 to 3 shall take into account, where relevant, the criteria set out in Schedule 7”.

3 CHARACTERISTICS OF PROPOSED DEVELOPMENT

Schedule 7 of SI 296 of 2018 requires that the characteristics of proposed development are identified. In particular, it references the following sections:

3.1 Size and Design

Monasterevin Bridge carries the R445 over the River Barrow located in the south western area of Monasterevin town, Co. Kildare. The bridge is a five span cut-stone road bridge built circa 1780. The superstructure is supported by 2 no. masonry abutments and 4 no. masonry piers. The arches are elliptical in shape with cut stone voussoirs. The original bridge deck was made of rubble stone that has since been rendered over. Concrete skirts have been retrofitted to the 2 no. abutments and 4 no. piers to provide scour protection.

The remedial works planned for this project, in relation to this EIAR include both instream and out of stream works including:

- Rock Armour Installation – along a 15m section
- Repair of Concrete Skirt that protects the piers including proposed scour protection and underpinning detail and reconstruction of the riverbed under some of the arches.
- De-vegetation and Repointing of Masonry
- Relaying of bridge surface.

3.2 Cumulation with other Existing Developments/Development the subject of a Consent

A review of Kildare County Council planning records for the area was undertaken. The review covered projects which are in receipt of a grant of planning within the last 7 years. None of these are to the scale and nature of these works and relate to developments, demolitions, renovations and conversion of building structures.

Taking into account the review of planning applications, it is considered unlikely that any of the proposed developments will result in a significant cumulative impact (including potential cumulative traffic impacts, surface water quality, etc). The proposed remedial works are short term by their very nature. Hence no significant potential cumulative environmental impacts have been identified to the proposed development (either during the construction or operational phases), arising from committed developments in the immediate vicinity.

3.3 The nature of any associated Demolition Works

Remediation works will involve removing and replacing certain elements such as the bridge skirts and masonry cutwater. However, demolition of the entire structure will not take place.

3.4 The use of Natural Resources, in particular Land, Soil, Water and Biodiversity

There will be no long-term use of any natural resource as this project by its very nature is of short-term duration and required to provide remedial works to a bridge structure.

3.5 Production of Waste

Any waste generated during the construction will firstly be reused on site where possible e.g. topsoil generated will be reused to provide landscaping and material excavated will be reused upon completion of the works. However, in the event that offsite disposal is required for any material it will be managed in accordance with all relevant waste management legislation. There will be no generation of waste following the completion of the works.

3.6 Pollution and Nuisances

There is the potential that there will be a temporary increase in noise during the proposed works. However, they will not exceed levels typical of construction works and are short-term in nature. There will be a slight increase in traffic disturbance during the construction activities i.e. bringing supplies to site, removal of material if required, however these will be short term in duration. Some dust will likely be generated during the works; however, this nuisance will be managed in line with best practice. There will be no pollution or nuisance during operations i.e. following the completion of works.

The instream works have the potential to result in direct water quality and disturbance impacts. Water quality impacts may arise due to an increase in suspended solids, with background levels already high, and accidental spillages of oil / fuel from machinery and / or concrete / cement. It is noted that water quality at the site during the current survey was noted as poor, with evidence of sewage fungus and heavy siltation (Ecofact 2020).

It is noted that there is a small section of Japanese Knotweed at the site, which can be easily spread to other areas and could impact aquatic habitats in the long term by populating the banks of the river. The de-vegetation works and cutback of overgrowth on the embankments could lead to significant invasive species impacts. Biosecurity mitigation measures are provided to avoid invasive species impacts (Ecofact 2020).

The footprint of the works will be limited and works areas will be surrounded by silt fences and sand bags. Appropriate set back distances from sensitive ecological and cultural heritage sites and the River Barrow will be maintained. The main site compound will not be located within 10 m of the river and will be located on dry land.

The appointed contractor will need to prepare a site-specific Construction Environmental Management Plan (CEMP) which will clearly set out all of the required environmental control measures needed including those identified in the NIS (Ecofact, 2020) including for example an Emergency Contingency Plan for the removal of sand bags during a flood event.

3.7 The Risk of major Accidents and/or Disasters including those caused by Climate Change

There is minimal risk of major accidents or disasters including those caused by climate change given the small-scale and temporary nature of the construction works. Any risks that are present are associated with typical construction risks including working with machinery. However, the appointed contractor will need to prepare a site-specific Construction Environmental Management Plan (CEMP) which will clearly set out all of the required environmental control measures needed.

There will be no risks following construction above that which would be expected for vehicular traffic using the bridge.

3.8 Risks to Human Health – e.g. Water Contamination/Air Pollution

Risks to water will be minimised via construction in line with best practice. Contractors will be required to implement construction methods in line with best practice such as storage of fuel and chemicals on site.

From a human health perspective, the nearest reported source protection zone (SPZs) (groundwater) is located 1.7km northwest of the bridge. The nearest SPZ is Monasterevin PWS.

There are reportedly 7No. boreholes on the GSI database within 2km of the site however their location accuracy is >2km and therefore their exact location is unknown. They date from 1899 to 1988 and are for private use.

Air pollution will be limited to typical construction nuisance such as dust given the short-term nature of the works and that the works will be conducted in accordance with best practice guidance. The same best practice guidelines will be applied to noise nuisance. Overall, the risk to human health is low.

4 LOCATION OF THE PROPOSED DEVELOPMENT

4.1 Information Sources

An understanding of the site setting, and history was gained by undertaking a review of the following primary sources including:

- A review of available extracts of historical Ordnance Survey of Ireland (OSI) maps;
- National Monuments Service (NMS) viewer;
- A review of information held by the Environmental Protection Agency (EPA) EnVision online Mapping;
- Aerial images available of the site (OSI and Google);
- The Geological Survey of Ireland (GSI) and GeoHive online mapping tools; and
- The National Parks and Wildlife Service online map tool.

4.2 Abundance, Availability, Quality and Regenerative Capacity of Natural Resources

Limited natural resources will be required to complete the works. It is proposed that material generated during the works is reused on site, where possible. The relevant natural resources have been looked at in more detail in the following sections.

4.3 The Absorption Capacity of the Natural Environment

In the description of the site, the absorption capacity of the natural environment has, in accordance with Regulations, been screened paying particular attention to:

- (i) wetlands, riparian areas, river mouths;
- (ii) coastal zones and the marine environment;
- (iii) mountain and forest areas;
- (iv) nature reserves and parks;
- (v) areas classified or protected under legislation, including Natura 2000 areas designated pursuant to the Habitats Directive and the Birds Directive and;
- (vi) areas in which there has already been a failure to meet the environmental quality standards laid down in legislation of the European Union and relevant to the project, or in which it is considered that there is such a failure;
- (vii) densely populated areas; and
- (viii) landscapes and sites of historical, cultural or archaeological significance.

4.3.1 Surrounding Land Use

The terrestrial environment is characterized not only by its physical land cover, but also from a human/social perspective by its land use which is distinguished by its designated or identifiable purpose (EPA, 2008).

The bridge is located on the outskirts of Monasterevin Town, with surrounding lands typical including agricultural, residential and industrial, with a water treatment plant 85m to the southwest. The site is bordered by the Road R424 and R414 to the north with residential/commercial properties. Farmland surrounds the remainder of the site to the east, south and west. The adjacent land uses are listed in Table 4.1 below.

Table 4.1 – Adjacent Land Uses

BOUNDARY	LAND USE
North	Road No. R424 and R414 with residential and commercial properties. Further north with farmlands.
South	Farmland, forested area, health care and convent to the south encompassing the area of Moore Abbey.
East	Residential/farmland mixed area to the east with the town of Nurney Road Gurteenooona further east, along with Motorway No. 7
West	Farmland to the west with further meanders of the River Barrow southwest. Monasterevin Wastewater treatment plant is located 100m southwest.

4.3.2 Site Development

The 6" historical map (1837-1842) shows the bridge and the surrounding areas of residential, forested areas and farmlands (refer to Figure 4.1).

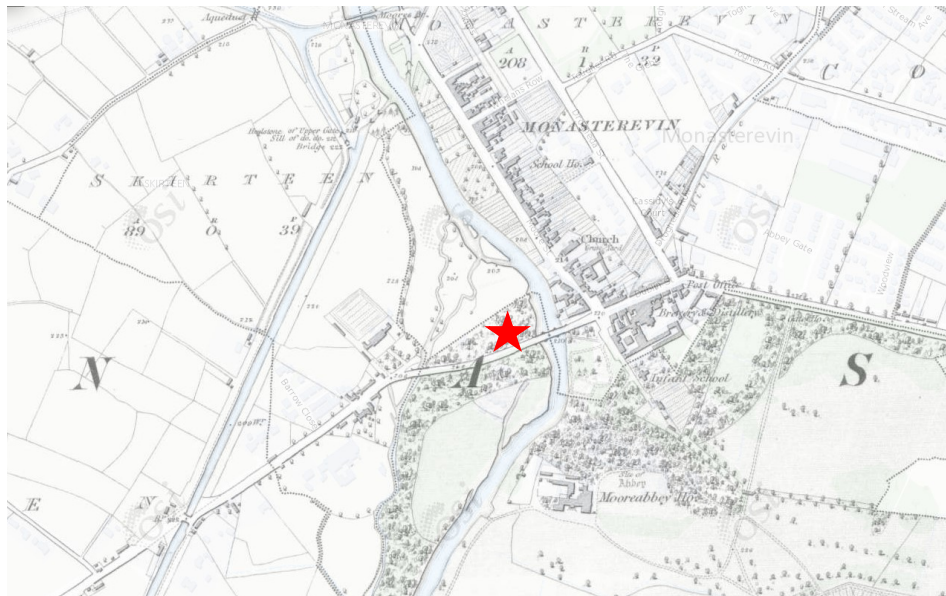


Figure 4.1. Approximate location of the proposed remediation on 1837-1842 6-inch OS Map (Source: Ordnance Survey Ireland)

Very little change occurred within the proximity of the site throughout the 1800's until the the latest aerial images, where more residential and industrial development occurred. Refer to Figure 4.2.



Figure 4.2 Approximate location of the proposed development on 1888-1913 25 Inch OS Map (Source: Ordnance Survey Ireland)

Aerial images of the site from 1995 and 2000 show the site layout as it is today, with the exception of more residential properties today. Currently, the site consists of the bridge and meandering floodplain of the River Barrow with agricultural land surrounding the site to the east, south, and north, and residential areas to the north and east.

4.3.3 Site Physical Setting

Information regarding the site topography, hydrology, geology, hydrogeology and ecology of the area has been obtained from records held by the Geological Survey of Ireland (GSI), Environmental Protection Agency (EPA) Envision online mapping tool, Ordnance Survey of Ireland (OSI), GeoHive, Water Framework Directive Maps and National Parks and Wildlife Service (NPWS) databases.

4.3.4 Hydrology

Monasterevin Bridge is located on the 5th order River Barrow (EPA Segment Code: 14_10474) in the town of Monasterevin in County Kildare where the R445 road crosses the main channel of the Barrow. The bridge is located just upstream of the confluence of the 2nd order Passlands watercourse (EPA Segment Code: 14_1410) with the River Barrow. The EPA monitor biological water quality in this stretch of the River Barrow with a station located on the next bridge upstream (Station Code S14BO11000). This site was rated as being Q3-4 (Moderate) in 2017. This site is located 1km upstream of the subject bridge site. The

Monasterevin Waste water Treatment Plant is located on the right bank of the river downstream of Monasterevin Bridge. A NIS for this plant was prepared in 2011 (Ecofact, 2011) and it was concluded that “the ongoing operation of the WwTP is therefore evaluated as affecting the integrity of the cSAC downstream”.

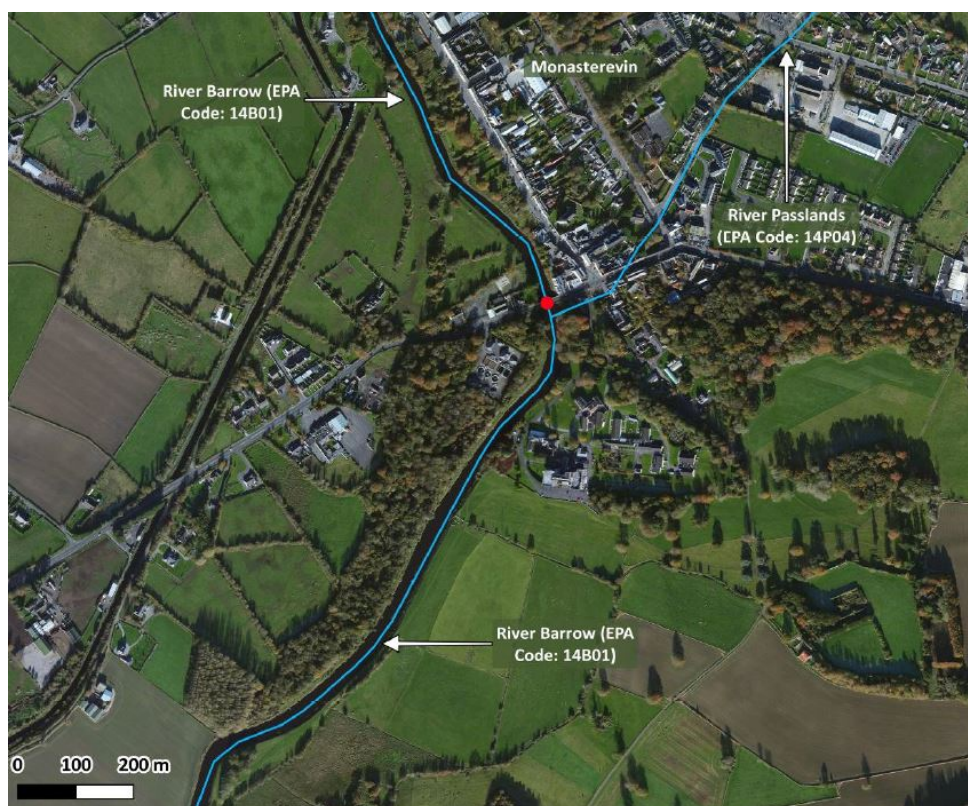


Figure 4.3 Bridge Location (Source: Ecofact, 2020)

A portion of the remediation of the Monasterevin Bridge will involve removing debris and re-grading the river bed of the River Barrow itself, therefore, the project could pose a moderate potential impact to both its status and risk status during the construction phase and also for a period of time following completion.

The site is located on the floodplains of the River Barrow. The Office of Public Works (OPW) is the national agency responsible for overseeing flood management. Under this remit and in accordance with the requirements of European Union 'Floods' Directive (2007/60/EC), the OPW published the Flood Risk Management Plan (FRMP) for Barrow River Basin in 2018. The objective of the FRMP was to set out a strategy and proposed measures, for management of flood risk in the basin. The OPW website detailed that there is no structural flood Relief Scheme for the township of Monasterevin, due to the fact there is low level of flood risk to the community. The current level of risk is stated by OPW to be reviewed on a regular basis to determine levels of flood risk.

4.3.5 Biodiversity

Natura Impact Statement

A standalone Natura Impact Statement has been completed by Ecofact (2020) (refer to Appendix A). Monasterevin Bridge is located within the River Barrow and River Nore SAC. The River Barrow and River Nore SAC (site code 002162) is selected for alluvial wet woodlands and petrifying springs, priority habitats on Annex I of the E.U. Habitats Directive, 1992. The site is also selected as a SAC for old oak woodlands, floating river vegetation, estuary, tidal mudflats, Salicornia mudflats, Atlantic salt meadows, Mediterranean salt meadows, dry heath and eutrophic tall herbs, all habitats listed on Annex I of the E.U. Habitats Directive. As well as habitats, the SAC has been selected due to the presence of invertebrate, fish and mammal species which are listed under Annex II of the EU Habitats Directive, including freshwater pearl mussel (*Margaritifera margaritifera* and its hardwater form *M. durrovensis*), freshwater crayfish (*Austropotamobius pallipes*), Atlantic salmon (*Salmo salar*), twaite shad (*Alosa fallax fallax*), the three Irish Lamprey species - sea (*Petromyzon marinus*), brook (*Lampetra planeri*) and river (*Lampetra fluviatilis*), the Desmoulin's whorl snail *Vertigo moulinsiana* and Eurasian otter (*Lutra lutra*).

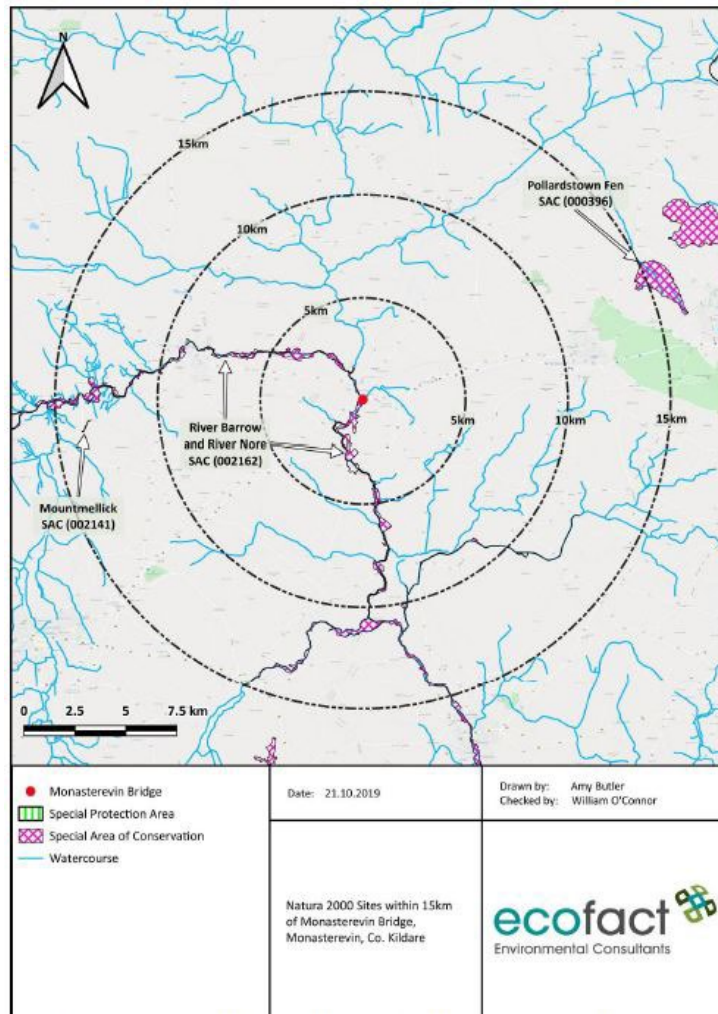


Figure 4.4 SAC & SPA Locations (Source: Ecofact, 2020)

Strict water quality protection measures will be implemented throughout the project to mitigate impacts on all aquatic Annex II species in the affected area, including Atlantic Salmon, Otter, Lamprey. White-clawed crayfish may be present downstream but were not present at the site; it is known that crayfish plague is present in the River Barrow. The only Annex I habitat that may be affected by the proposed works is Floating River Vegetation, which although is not present at the site, may be present downstream and therefore could be impacted by water quality.

Potential impacts on qualifying interests of the River Barrow and River Nore SAC that have potential to be affected by the proposed works at Monasterevin Bridge were identified in the NIS (Ecofact 2020), with mitigation measures required and residual impacts identified. In summary:

- Atlantic Salmon – No residual impacts
- Otter – No residual impacts
- Lamprey Species – No residual impacts
- White-clawed Crayfish – No residual impacts
- Floating river vegetation – No residual impacts

Biodiversity - locally

In addition to the NIS, Ecofact also completed a Biodiversity assessment (refer to Appendix B). They were commissioned to survey the study area in order to evaluate the biodiversity receptors present at the site and outline the findings in a report.

The nearest Proposal Natural Heritage Area (pNHA) is the Grand Canal pNHA (Site Code 002104) located approximately 0.5km to the west of the site. It is not considered that the works will impact this site in particular given that the intersection of the Barrow and the canal is at Athy. According to an ecological survey of the Grand Canal, the section of the Barrow Line with the highest diversity was along the stretch that passes Monasterevin.



Figure 4.5 Bridge Location relative to SAC and pNHA (Source: NPWS, 2020)

There are no SPAs or other designated areas in the surrounding environment that could be impacted by the proposed project. Moore Abbey Woods is currently not a designated site however it has been noted as an important area for nature conservation. This woodland is just over 1 km to the South East of Monasterevin Bridge.

Ecofact undertook a desk study and site walkover and assessed the following:

- Habitats and Flora – main impacts in the immediate vicinity of the bridge.
- Fauna including:
 - Non-volant mammals – There was no evidence of mammal use or present on the banks of the river. Nor were there otter holts or other non-volant mammal dwelling present.
 - Bats – there is no evidence that Monasterevin Bridge is used as a bat roost. However, crevices with potential for bats are present and a derogating licence and mitigation for bats will be required.
 - Birds – there is no evidence that birds nested in the bridge in 2019. There were no kingfisher nest sites within 100m+ of the bridge.
 - Aquatic ecology – potential impact such as suspended solids and accidental spillages.
 - Reptiles and amphibians – proposed works will not affect important reptile and/or amphibian habitat.
 - Terrestrial Macroinvertebrates – no notable or protected species present.

A number of mitigation measures have been identified within the biodiversity report (Appendix B) and residual impacts were summarised as follows:

- Designated areas – no residual impacts
- Habitats and Flora – riparian habitat will recover over time and there will be no long term significant negative effect.
- Fauna
 - Non-volant mammals – No residual impacts. Only temporary disturbance.
 - Bats – no significant residual impacts
 - Birds – In the long term the project will not affect the downstream bird habitats as the works do not involve alterations to the downstream river or its banks and habitats. If water quality protection measures are adhered to during the project there should be no residual impacts on water quality which could affect the fish and thus, the food source of the Kingfisher.
 - Aquatic ecology – No residual impacts on aquatic ecology are anticipated if the outlined mitigation is followed.

Given the nature of the development, its' scale, the existing localised and temporary nature of the construction effects identified it is concluded that the project is not foreseen to give rise to any significant adverse effects on the biodiversity local to the site, either alone or in combination with any other plans or projects.

Biosecurity

Biosecurity measures will follow NRA guidelines 'The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads' (NRA, 2010) and the IFI guidelines

'Biosecurity Protocol for Field Survey Work' (IFI, 2010). Japanese Knotweed is present at the site with a stand of the invasive plant located on the left (east) bank just upstream of the bridge. Crayfish plague is also known to occur in the River Barrow.

4.3.6 Topography

The regional topography of the area is generally quite varied in elevations with the River Barrow carving a small valley through the area via a network of meanders in the river course.

4.3.7 Unconsolidated Geology

According to the Teagasc Soil Information System, the topsoil and subsoil beneath the site has been classified into two main categories. Alluvium (mineral origin) and peaty poorly drained mineral. This is expected given the nature of the site consisting the floodplain of the River Barrow itself. The topsoil of the surrounding area consists of a number of various soil types with the site located; with within the site described as urban fabric, and heterogeneous agricultural areas. Just east of the site the soil is described as limestone till, as the till is described of Carboniferous origin.

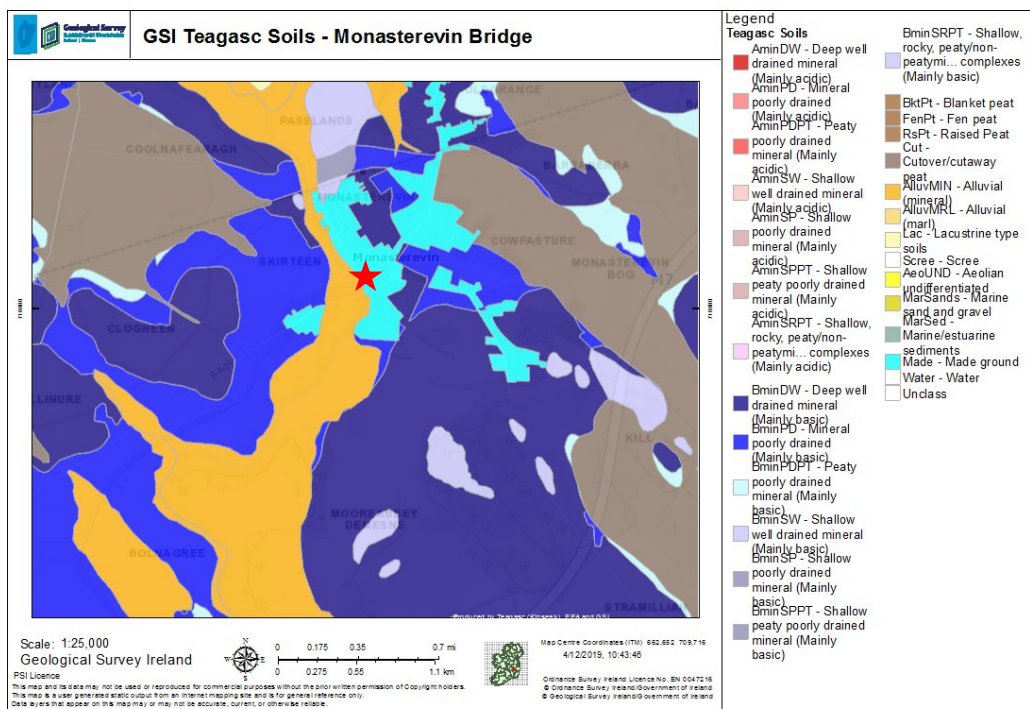


Figure 4.6 Teagasc Topsoils and Subsoils

4.3.8 Geology

The bedrock of the Monasterevin village consists of thick-bedded limestone of the Allenwood Formation of the Carboniferous Period. The Allenwood Formation consists of pale-grey massive shelf limestones and dolomite.

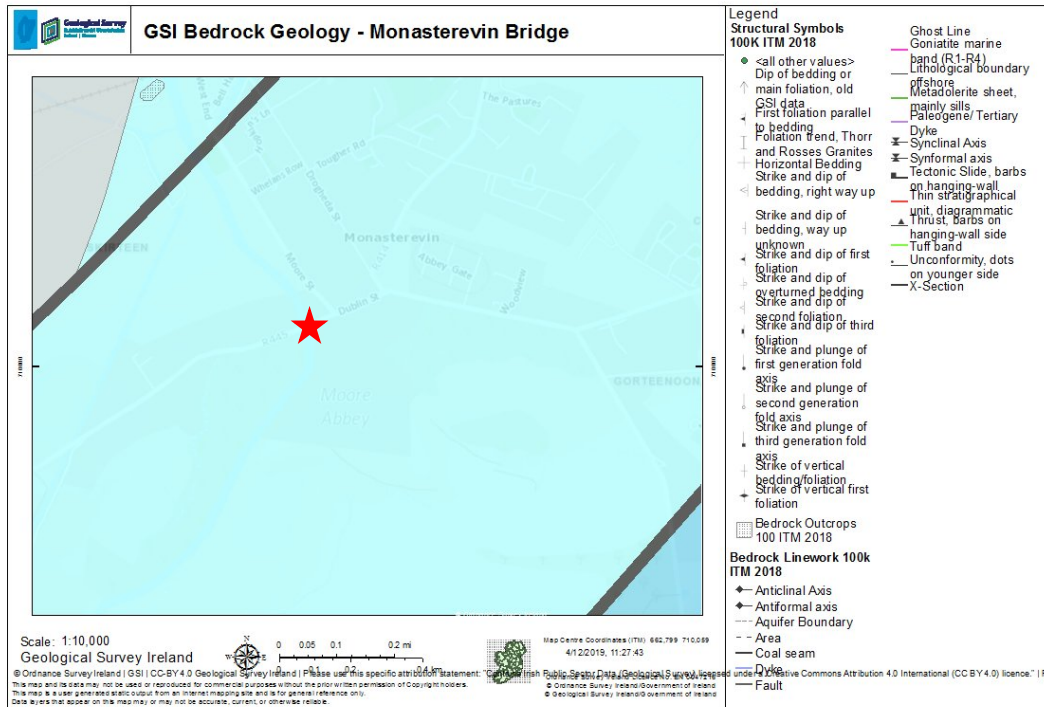


Figure 4.7 Geology

There are no major geological faults mapped in the vicinity of the site. There is a geological fault 500m northwest of the site.

4.3.9 Area of Geological Interest

The Geological Survey of Ireland (GSI) online mapping service was consulted regarding areas of geological interest in the area of the site. There are no geological heritage areas listed on or within close proximity of the site. The nearest area of geological heritage is The Curragh 12.3km to the east of the site, which is listed as the "core area of the Curragh grasslands", with a unique deposit of fluvio-glacial gravels.

Geology is recognised as an intrinsic component of natural heritage in three separate pieces of legislation or regulations, which empower and require various branches of Government and statutory agencies to consult and take due regard for conservation of geological heritage features. These are:

- Planning and Development Act 2000 [e.g. Sections 212 (1)f; Part IV, 6; First Schedule Condition 21],
- Planning and Development Regulations 2001,
- Wildlife (Amendment) Act 2000 [enabling Natural Heritage Areas]

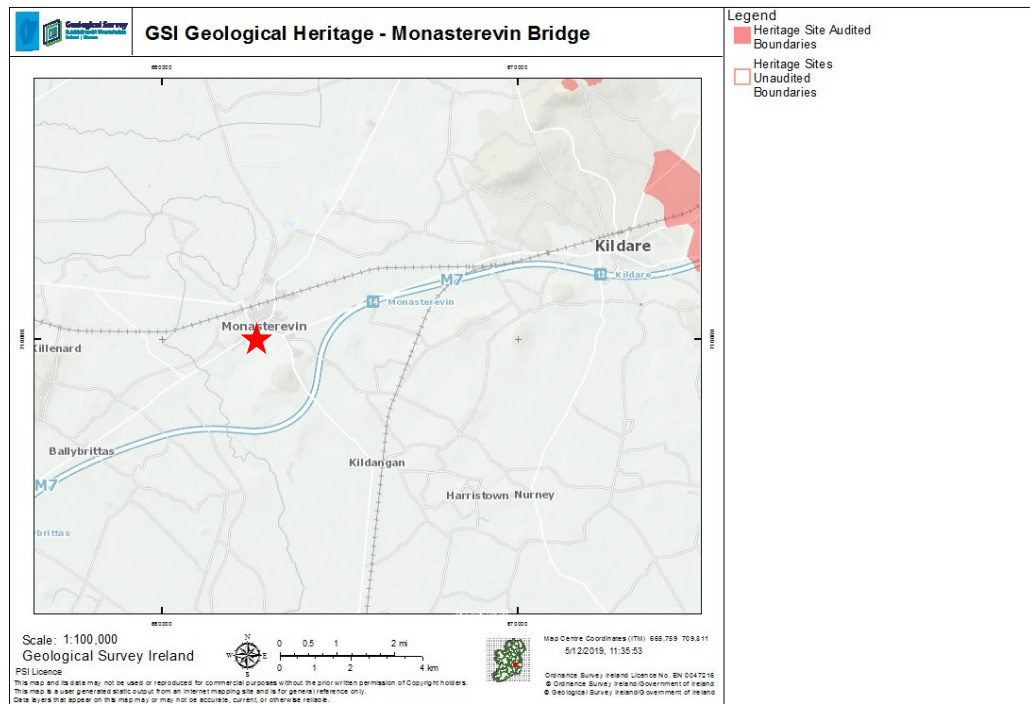


Figure 4.8 Approximate location of the proposed remediation with nearest area of Geological Heritage

Given the distance between the site and the two nearest areas of geological interest, it can be considered that it is not within the area of influence of the proposed development.

4.3.10 Aquifers

The GSI provides a methodology for aquifer classification based on resource value (Regionally Important, Locally Important and Poor) and vulnerability (Extreme, High, Moderate or Low). Resource value refers to the scale and production potential of the aquifer whilst vulnerability refers to the ease with which groundwater may be contaminated by human activities (vulnerability classification primarily based on the permeability and thickness of subsoils).

The primary Groundwater Body (GWB) groundwater aquifer beneath the site, a karstified aquifer, is listed as regionally important. The bedrock GWB covers some 2,343km². The bedrock aquifer is described as Dinantian Pure Bedded Limestones.

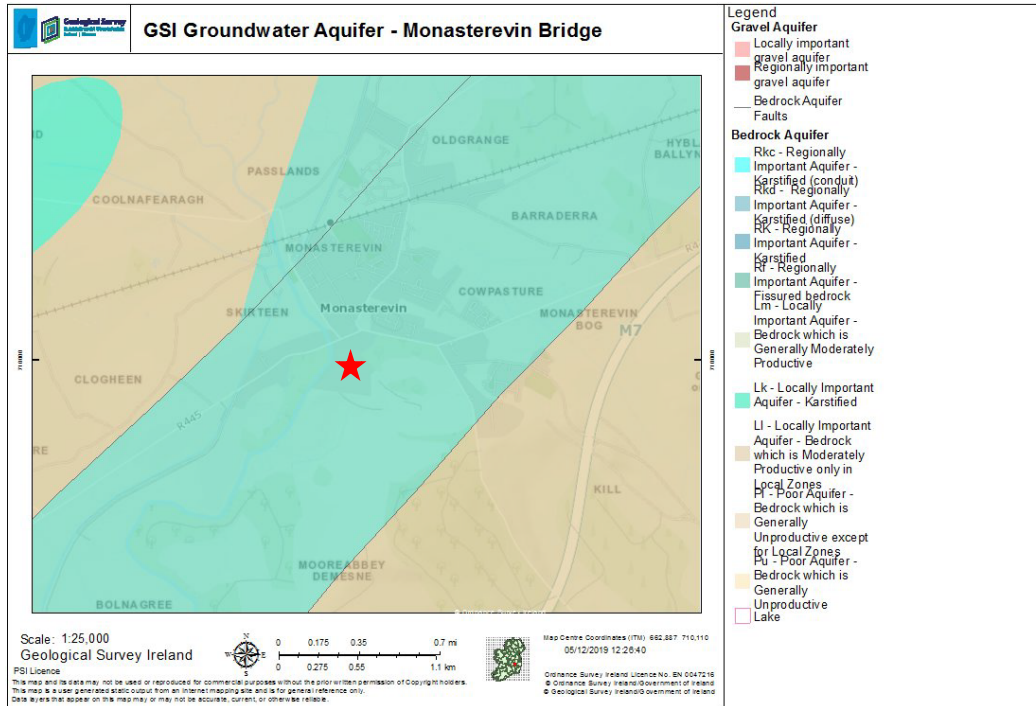


Figure 4.9 Aquifers

The impact of the proposed project on the aquifers beneath the site will be negligible. The proposed works will not alter or impede groundwater flow as the proposed project does not include a deep excavation or drilling to impact the aquifer beneath.

4.3.11 Groundwater Vulnerability

The groundwater vulnerability beneath the site is described as Moderate; (GSI 2020). Vulnerability ratings are related to a function of overburden thickness and permeability which might offer a degree of protection and/or attenuation to the underlying aquifer from surface activities and pollution. The site is bordered to the north and south by a 'High' vulnerability rating area.

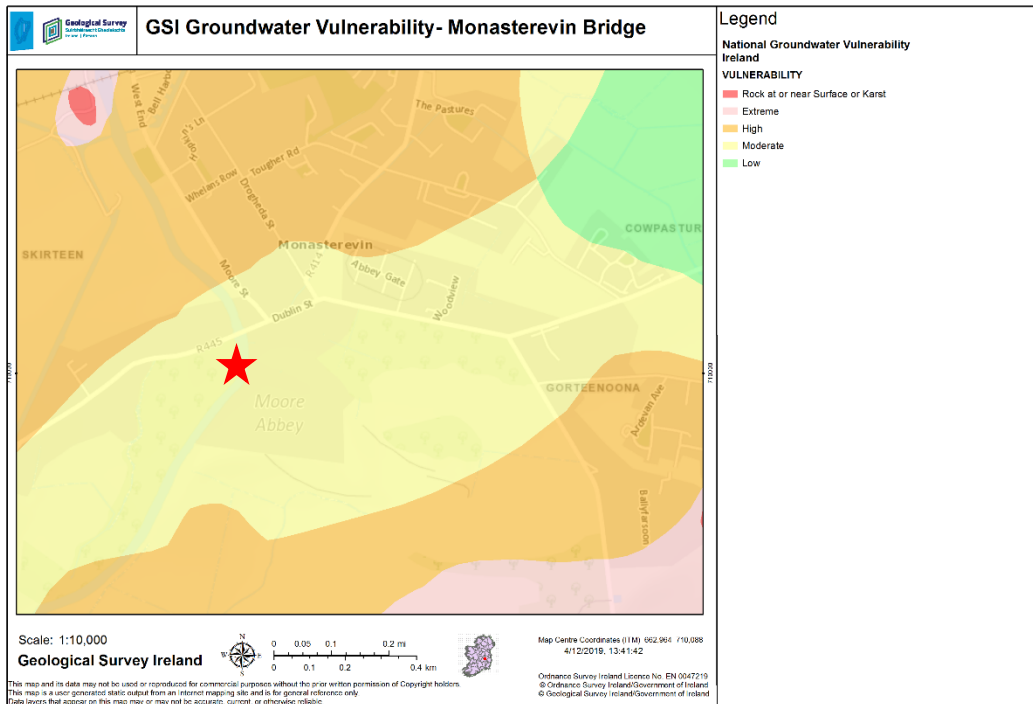


Figure 4.10 Aquifer Vulnerability

4.3.12 Groundwater Recharge

Diffuse recharge generally occurs via rainfall percolating through the subsoil with its rate being higher in areas where the subsoil is thinner and/or more permeable. The proportion of effective rainfall that recharges the aquifer is largely determined by the thickness and permeability of the soil and subsoil, and by the slope. The site in its current state and after the remediation, will have runoff from the impermeable road surfaces, draining into the river and soil surrounding the site. The east border of the site location is listed with the only differences between the main groundwater recharge information being: hydrogeological setting is 3m and description of “made ground”; average recharge is 79mm/yr; soil drainage “made”; and recharge coefficient is “20%”. The GSI’s groundwater recharge model parameters for the site are summarised in Table 4.2.

Table 4.2 GSI Groundwater Recharge Parameters

Groundwater Recharge Parameters	
Average Recharge (mm/yr):	89
Hydrogeological Setting:	3.ii
Hydrogeological Setting Description:	Moderate permeability subsoil and overlain by poorly drained gley soil
Soil Drainage:	Wet
Subsoil Type:	A
Subsoil Description:	Alluvium
Subsoil Permeability:	Moderate
Subsoil Permeability Description:	Moderate
GW Vulnerability:	M
GW Vulnerability Description	Moderate
Aquifer Category:	Rkd
Aquifer Category Description:	Regionally Important Aquifer – Karstified (diffuse)
Recharge Coefficient (%):	22.50
Maximum Recharge Capacity (mm/yr):	Not Listed
Effective Rainfall (mm/yr):	395

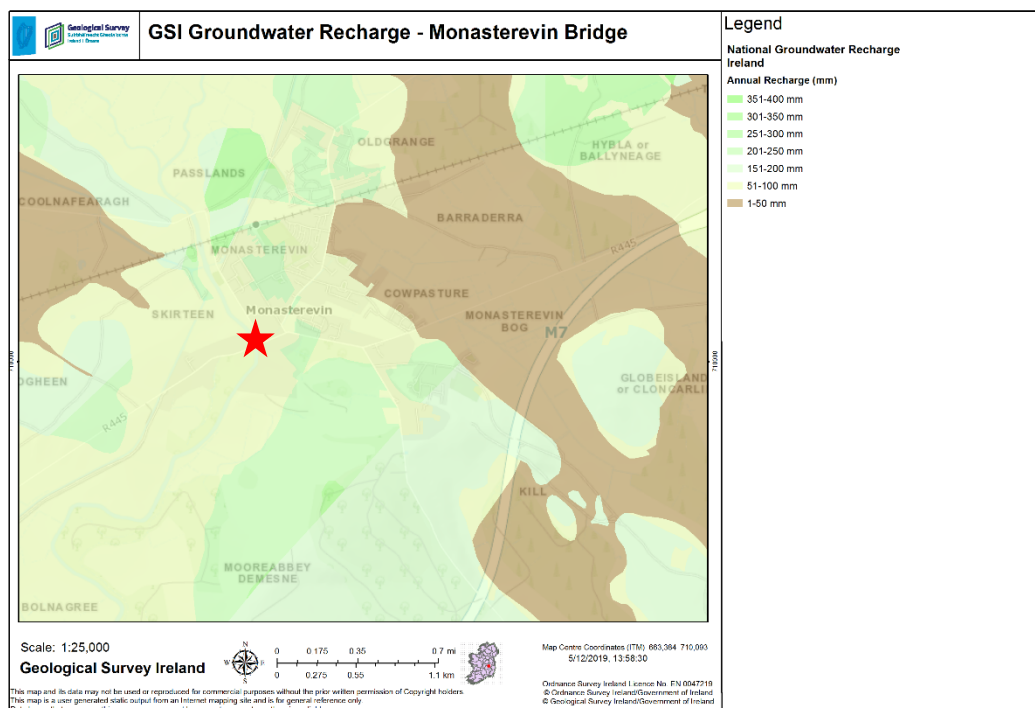


Figure 4.11 Groundwater Recharge

4.3.13 Wells & Springs

A search of the GSI groundwater well database was conducted to identify registered wells in the surrounding area. Seven boreholes were identified. All seven boreholes/wells are given a rough estimate of the location to lack of specific information regarding the location, the location accuracy for all is up to 2km around the site location.

Table 4.3 Nearby GSI Groundwater Wells

GSI Name	2619NWW381	2619NWW379	2619NWW378
Distance to site (km)	Up to 2	Up to 2	Up to 2
Well Type	Borehole	Borehole	Borehole
Drill Date	December 30, 1899	December 30, 1899	December 30, 1899
Depth (m)	24.3	10.4	7.9
Depth to rock confidence	10.6	Unknown	Unknown
Location	Unknown	Unknown	Unknown
Easting	262,600	262,800	262,800
Northing	209,980	209,900	209,980
Well use	Agricultural and domestic	Agricultural and domestic	Agricultural and domestic
Yield class	Poor	Poor	Poor

Yield m³d	10.9	21.8	21.8
GSI Name	2621SWW150	2621SWW172	2621SWW129
Distance to site (km)	Up to 2	Up to 2	Up to 2
Well Type	Borehole	Dug well	Borehole
Drill Date	January 27, 1988	December 30, 1899	January 28, 1972
Depth (m)	27.4	4.3	25.9
Depth to rock confidence	7	Unknown	12.2
Location	Unknown	Unknown	Unknown
Easting	262,940	262,610	262,710
Northing	210,530	210,580	210,720
Well use	Domestic only	Unknown	Unknown
Yield class	Poor	Poor	Poor
Yield m³d	32.7	10.4	27.28
GSI Name	2621SWW173		
Distance to site (km)	Up to 2		
Well Type	Borehole		
Drill Date	December 30, 1899		
Depth (m)	24.4		
Depth to rock confidence	10.7		
Location	Unknown		
Easting	262,770		
Northing	210,480		
Well use	Unknown		
Yield class	Poor		
Yield m³d	10.9		

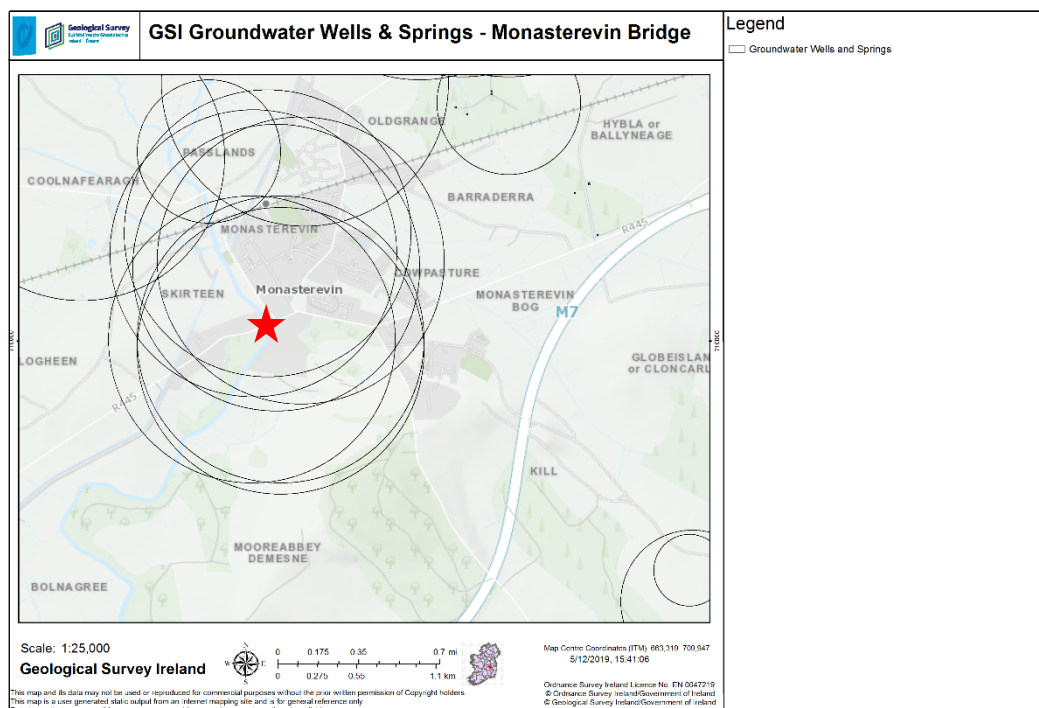


Figure 4.12 Wells and Springs

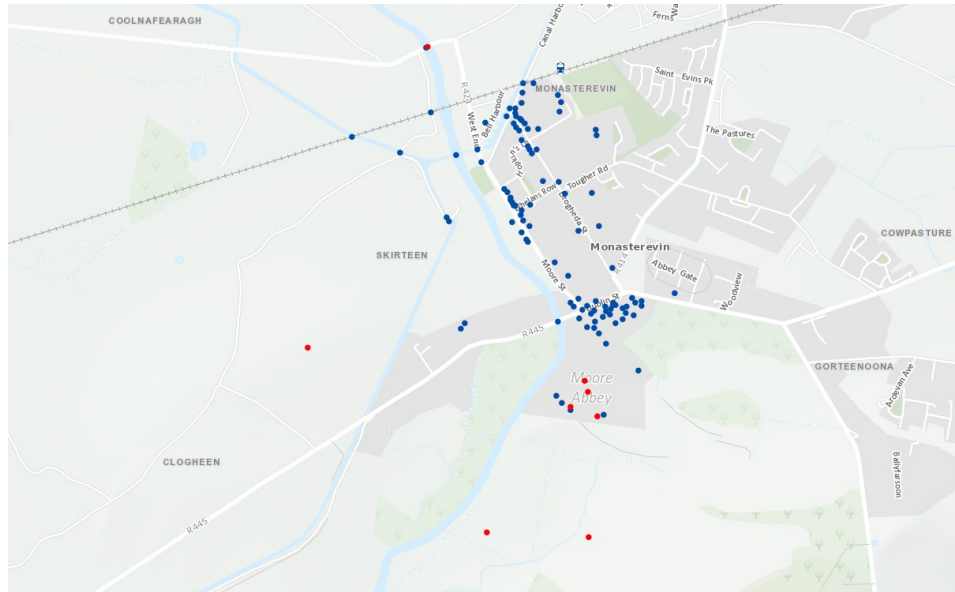
The GSI (1999) also provides a framework for the protection of groundwater source zones (e.g. areas of contribution to water supply bores). There are no reported source protection zones (SPZs) within the site area. There is one reported (SPZs) within a 2km radius of the proposed site. The Monasterevin Well Field SPZ is located 1.75km to the northwest of the site, and is listed as an active SPZ.

Based on a review of available information, local groundwater flow is expected to the south/southwest.

4.3.14 Protected Structures

National Monuments Service (NMS) maps shows that the Monasterevin Bridge as a protected structure. An Architectural Heritage Impact Report was prepared by Shaffrey Architects (Refer to Appendix C) and the report concluded that the 'the proposed works will not have an adverse impact on the heritage special interest value of the protected structure'.

Protected structures adjacent to the Bridge are located in Monasterevin to the east and to the southeast of the site in Moore Abbey; however, these should not see effects due to the nature of the proposed works of the project.



**Figure 4.13 Protected structures within and surrounding site's boundary
(Source: Ordnance Survey Ireland)**

The Kildare County Development Plan for 2017-2023 was consulted in relation to protected or designated landscapes. No zone of Archaeological potential, protected view/objective, scenic route, tree preservation order, walking route or tree or woodland preservation objectives was not listed for the village of Monasterevin. However, the Architectural Heritage Impact Report identified Monasterevin Bridge as located on the periphery of the Monasterevin Conservation Area and concluded that the proposed works will not adversely impact on the historic urban context and the overall setting of the bridge on the River Barrow.

5 TYPES AND CHARACTERISTICS OF POTENTIAL IMPACTS

The likely significant effects on the environment of proposed development in relation to the criteria outlined below.

5.1 Magnitude and Spatial Extent of Impact

This project relates to remedial works to Monasterevin Bridge. Main risks include the fact that the bridge is a Protected Structure however these works are needed to maintain the bridge and will be completed in accordance with the conservation archaeologist's assessment – **Note, report to be updated.**

The bridge is located within a Special Area of Conservation (SAC) and therefore, remedial measures identified in the NIS shall be included in the CEMP and completed during the site works under the supervision of an Ecologist. It was determined that no residual impact will remain following the completion of works.

5.2 The Nature of the Impact

This project relates to remedial works to a bridge. This project is small in magnitude and extent. Any potential impacts are not likely to be significant.

5.3 The Transboundary Nature of the Impact

There is no potential for transboundary impacts.

5.4 The Intensity and Complexity of the Impact

The project involves remedial works to an existing bridge. A small area is affected as part of the works and any potential impacts are not likely to be significant.

5.5 The Probability of the Impact

The area affected will be to the embankment growth/vegetation removal and associated river channel works. The probability of impacts is low taking into account the following considerations:

- A project specific method statement will be prepared by the appointed contractor prior to the commencement of works, detailing how it will incorporate and comply the mitigation measures set out in the NIS.
- An on-site ecologist will monitor water quality in the works area, and be on site on a regular basis to ensure compliance with the environmental and ecological protection measures specified in the NIS.

5.6 Expected Onset, Duration, Frequency and Reversibility of the Impact

Small area affected which has been limited to the remedial works identified. The duration will be outside of sensitive ecological seasons and will be completed within a short timeframe. The works will be permanent

5.7 The Cumulation of the Impact with the Impacts of other Existing and/or Future Developments

There are no cumulative impacts arising from this project based on a review of planning.

5.8 The Possibility of Effectively Reducing the Impact

Small area affected which has been limited to the remediation of an existing bridge. A CEMP will be prepared by the appointed contractor taking into account all of the site details will take account of all required mitigation measures, regarding the environmental and ecological protection parameters.

Potential exists, particularly at the construction stage for an amount of nuisance associated with localised traffic disruption and construction noise and dust. However, for the most part construction works related to this project are likely to be 'low-key' and temporary.

5.9 Screening Decision

Having regard to the above, and in particular to the nature, scale and location of the proposed project, by itself and in combination with other plans and projects, it is considered that the overall impact on the receiving environment is considered low.

Therefore, it is not considered that an EIA is required at this time. Please refer to the completed Screening Checklist identified in European Commission publication Environmental Impact Assessment of Projects, Guidance on Screening (2017).

Checklist	Response
Will there be a large change in environmental conditions?	No
Will new features be out-of-scale with the existing environment?	No
Will the impact be unusual in the area or particularly complex?	No
Will the impact extend over a large area?	No
Will there be any potential for transboundary impact?	No
Will many people be affected?	No
Will many receptors of other types (fauna and flora, businesses, facilities) be affected?	No residual impacts (refer to NIS)
Will valuable or scarce features or resources be affected?	No residual impacts (refer to NIS)

Is there a risk that environmental standards will be breached?	No residual impacts (refer to NIS)
Is there a risk that protected sites, areas, features will be affected?	No residual impacts (refer to NIS)
Is there a high probability of the effect occurring?	No
Will the impact continue for a long time?	Temporary short term.
Will the effect be permanent rather than temporary?	No residual impacts (refer to NIS)
Will the impact be continuous rather than intermittent?	Temporary short-term during construction. No residual impacts (refer to NIS)
If it is intermittent will it be frequent rather than rare?	-
Will the impact be irreversible?	-
Will it be difficult to avoid, or reduce or repair or compensate for the effect?	-



APPENDIX A. NIS



APPENDIX A. NIS

Rehabilitation Works at Monasterevin Bridge, Co. Kildare

NATURA IMPACT STATEMENT



Version: 20th March 2020



Tait Business Centre, Dominic Street, Limerick City, Ireland.

t. +353 61 313519, f. +353 61 414315

e. info@ecofact.ie

w. www.ecofact.ie



TABLE OF CONTENTS

1. INTRODUCTION	3
1.1 CONSULTATION	3
1.2 LEGISLATIVE CONTEXT	3
2. METHODOLOGY	6
2.1 DESKTOP REVIEW	6
2.2 SITE SURVEY	6
2.3 APPROPRIATE ASSESSMENT METHODOLOGY	6
2.3.1 <i>Natura Impact Assessment</i>	7
2.4 CONSULTATION	7
3. DESCRIPTION OF THE PROJECT	8
4. RECEIVING ENVIRONMENT	9
4.1 BACKGROUND DESK STUDY	9
4.1.1 <i>Fish</i>	10
4.1.2 <i>Water Quality</i>	10
4.1.3 <i>Other Ecology</i>	11
4.2 DESCRIPTION OF NATURA 2000 SITES AFFECTED	13
4.2.1 <i>River Barrow and River Nore SAC</i>	13
5. IMPACT ASSESSMENT	19
5.1 RIVER BARROW AND RIVER NORE SAC	19
5.1.1 <i>Atlantic salmon (1106)</i>	19
5.1.2 <i>Otter (1355)</i>	19
5.1.3 <i>Lamprey Species (1095, 1096, 1099)</i>	20
5.1.4 <i>White-clawed Crayfish (1092)</i>	20
6. MITIGATION	22
6.1 BEST PRACTICE PROCEDURE AND GUIDELINES	22
6.2 AVOIDANCE	22
6.3 WATER QUALITY PROTECTION	23
6.4 BIOSECURITY	24
6.5 SITE ECOLOGIST	24
6.6 HABITAT ENHANCEMENT	25
7. IMPLICATIONS FOR CONSERVATION OBJECTIVES	25
7.1 CONSERVATION OBJECTIVES FOR RIVER BARROW AND RIVER NORE SAC	25
8. CONCLUSION STATEMENT	27
REFERENCES	30
PLATES	32
APPENDIX 1 SCREENING FOR APPROPRIATE ASSESSMENT MATRIX	36
APPENDIX 2 NPWS SITE SYNOPSES	38
APPENDIX 3 METHOD STATEMENT	44



1. INTRODUCTION

Kildare County Council proposes to carry out rehabilitation works on Monasterevin Bridge. This bridge crosses the River Barrow which is located within the River Barrow and River Nore SAC (Code 002162). The location of the proposed development is presented in Figure 1. A Screening for Appropriate Assessment Matrix is provided in Appendix 1. Only one Natura 2000 site is likely to be affected - the River Barrow and River Nore SAC. The site synopsis for this SAC is provided in Appendix 2.

The Screening for Appropriate Assessment concluded that there was the potential for direct, indirect and cumulative impacts on this SAC and therefore a Natura Impact Statement was required. Potential direct impacts were identified as water quality and disturbance impacts. Potential indirect impacts were comprised of water quality, disturbance and non-native invasive species impacts. Cumulative impacts were also identified concerning water quality pollution, due to background pressures in the River Barrow. Mitigation is required for the proposed works and therefore a Natura Impact Statement is required.

An Article 6 Appropriate Assessment is required under the Habitats Directive (92/43/EEC), in instances where a plan or project may give rise to significant effects upon a Natura 2000 site. Natura 2000 sites are those identified as sites of European Community importance designated under the Habitats Directive (1992) and EC Birds Directive (2009/147/EC); transposed into Irish legislation as the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011). The Habitats Directive, in combination with the Birds Directive (2009), establishes a network of internationally important sites designated for their ecological status; identified as Special Areas of Conservation (hereafter referred to as SACs) designated under the Habitats Directive for the protection of flora, fauna and habitats and as Special Protection Areas (hereafter referred to as SPAs) designated under the Birds Directive to protect rare, vulnerable and migratory birds. These sites together form a Europe-wide 'Natura 2000' network of designated sites, referred to in this report as Natura 2000 sites.

The preparation of this NIS follows the Habitats Directive 92/43/EEC, Article 6(3) and the guidance published by the National Parks and Wildlife Service (NPWS, 2010) '*Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities*'. The current NIS report was prepared by Ecofact Environmental Consultants Ltd. on behalf of Kildare County Council and presented to inform the Appropriate Assessment for the proposed bridge works.

1.1 Consultation

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

- National Parks and Wildlife Service (NPWS);
- Inland Fisheries Ireland (IFI);
- Environmental Protection Agency (EPA);

1.2 Legislative context

The current assessment takes account of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora - '*The Habitats Directive*' which was transposed into Irish law by the '*European Community (Natural Habitats) Regulations 1997*' (S.I. No. 94/1997). The most recent



transposition of this legislation in Ireland is the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011). The Birds Directive (2009/147/EC) which is now included in the former Regulations seeks to protect birds of special importance by the designation of SPAs whereas the Habitats Directive does the same for habitats and other species groups within SACs, which are designated or proposed as candidate Special Areas of Conservation (cSACs). It is the responsibility of each member state to designate SPAs and SACs, both of which will form part of Natura 2000, a network of protected areas throughout the European Community. Article 6, paragraphs 3 and 4 of the EC ‘Habitats’ Directive (1992) state that:

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

6(4) ‘If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted. Where the site concerned hosts a priority natural habitat type and / or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.’

In addition, the European Court of Justice in Case C-127/02 (the “Waddenzee Ruling”) has made a relevant ruling in relation to Appropriate Assessment and this is reflected in the current assessment:

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



Figure 1 Location of Monasterevin Bridge, Monasterevin, Co. Kildare.



2. METHODOLOGY

2.1 Desktop Review

A desktop study was undertaken to identify the extent and scope of the potentially affected designated Natura 2000 sites within the current study area, in relation to the proposed remedial works at Monasterevin Bridge in Co. Kildare. The desktop study identified the conservation interests of the designated sites with respect to the qualifying interests (species and habitats) relevant to the designated sites within the area.

A review of published literature was undertaken in order to collate data on the receiving environment, including aquatic species and habitats of conservation concern in the study area. A range of additional sources of information including scientific reports produced by, and information on the websites of the EPA, NPWS and other agencies were also reviewed. A full bibliography of information sources reviewed is given in the reference section.

2.2 Site Survey

Monasterevin Bridge was visited on the 13th to 14th September 2019 to conduct field surveys. These surveys included habitat surveys, mammal survey (including Otters), aquatic ecology surveys and bird surveys. General protected species surveys were also undertaken to identify any species of ecological importance within the study area. The bridge was surveyed for the presence of otters or other mammals from 100m upstream of the bridge to 100m downstream of the bridge (with further general checks to 200m from the bridge). Any evidence of mammal usage was recorded. The bridge was checked for any evidence of bat usage such as droppings, staining or smearing. Any birds or evidence of birds nesting were recorded. Dip net (kick) sampling surveys were undertaken to assess the presence or absence of small fish and lampreys. Habitat in the area was assessed for the potential to have reptile, amphibian or protected terrestrial invertebrate habitat. The flora and fauna at the site were identified and evaluated for ecological importance.

2.3 Appropriate Assessment Methodology

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

- **Stage One: Screening / Test of Significance** - The process which identifies the likely impacts upon a Natura 2000 site of a project or plan, either alone or in combination with other projects or plans, and considers whether these impacts are likely to be significant;
- **Stage Two: Appropriate Assessment** - The consideration of the impact of the project or plan on the integrity of the Natura 2000 site, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts;
- **Stage Three: Assessment of Alternative Solutions** - The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site; and



- **Stage Four: Assessment Where Adverse Impacts Remain** - An assessment of compensatory measures where, in the light of an assessment of Imperative Reasons of Overriding Public Interest (IROPI), it is deemed that the project or plan should proceed.

The safeguards set out in Article 6(3) and (4) of the Habitats Directive are triggered not by certainty but by the possibility of significant effects. Thus, in line with the precautionary principle, it is unacceptable to fail to undertake an appropriate assessment on the basis that it is not certain that there are significant effects.

2.3.1 Natura Impact Assessment

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

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

2.4 Consultation

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

- National Parks and Wildlife Service (NPWS);
- Inland Fisheries Ireland (IFI);
- Environmental Protection Agency (EPA);
- National Biodiversity Data Centre online database



3. DESCRIPTION OF THE PROJECT

Monasterevin Bridge is a five-arch bridge along which the main road (R445) in Monasterevin in County Kildare crosses over the main channel of the River Barrow. The limestone square cut, masonry arch structure is supported by two Masonry abutments and four Masonry piers. The proposed project relates to remediation works of the bridge. The proposed works are outlined in the method statements prepared by O'Connor, Sutton, Cronin Multidisciplinary Consulting Engineers (OCSC, 2019 and 2020). The work that is required involves both in-stream and out-of-stream works on the walls of the structure itself, as well as on the embankments and the surface of the bridge. As stated in the remediation methodology, "*The proposed repair works consists of repointing of the parapets, relaying of the bridge surface, reconstruction of the riverbed under some of the arches, removal of vegetation from embankments and the inclusion of underpinning repairs to the upstream cutwaters of the R445 bridge*" (OCSC, 2020). All works will be complete between July 1st and September 30th 2020.

The road surface on the bridge is currently uneven due to past patch repairs; the proposed works involves planning and resurfacing the road on the bridge, not including the footpaths which are currently in good condition.

De-vegetation and cut-back of overgrowth is required for the upstream and downstream embankments, including the removal of a tree on the upstream east embankment.

Much of the walls of the structure require raking and re-pointing of the joints this includes walls of the parapets (approximately 60%), both upstream and downstream and both river and roadside. It also includes the abutments (approximately 30/40%) and the spandrel walls. Vegetation growth on the structures surfaces and in the joints must also be removed before raking and repointing. Removal and reinstatement of the capping on the parapet walls, both upstream and downstream, will be required in some sections, in order to remove vegetation growing underneath the capping. According to the methodology the masonry surfaces that are undergoing repairs will be cleaned with a high pressure jet to remove dirt, surface deposits and surface vegetation from the structure. Raking may involve the use of plugging chisel and hammer or brushing with a stiff wire brush while keeping surrounding masonry suitably damp and ensuring that there is no weeping flow / pooled water. It is also stated in the methodology that no lime mortar re-pointing will be carried out if temperatures are expected to fall below 5°C within 1 week of this being undertaken. Re-pointing and vegetation removal will be carried out in sections, coinciding with the timing of the underpinning works on each pier to avail of the existing protection measures.

In-stream, the river bed erosion will be addressed by removing debris and re-grading the river bed, under Arch 1 and under Arch 4. Evident scouring on several of downstream piers resulted in the inclusion of scour protection measures in the proposed works. Some piers also require reconstruction or additional repairs as well as the joint raking and re-pointing, including Pier 2 and Pier 3 which are settling away from the bridge, new concrete skirts and masonry cutwater repairs are required. Dry works areas for the works under the bridge will be created with sheet piling. There will be one dry works area in place at any given time, i.e. one pier will be worked on at a time. On completion of one section all debris / material will be removed from the area, any river bed disturbance will be reinstated and the sheet piling will be removed to allow the flow in the channel to return to normal before the next dry works area for the next pier will be prepared. Grouting will be required for some of these in-stream works and silt curtains will be installed to prevent accidental grout entering the water. Some material for the masonry cutwaters and concrete skirt works will be removed and disposed of off-site



while some will be stored and used in the reconstruction. Steel dowel bars and sheets are to be drilled through the existing piers. Cast-in-situ concrete will be required for the new concrete skirt.

Reconstruction of an outfall pipe on the east downstream bank which has collapsed will be carried out. The wall at the outfall of a culvert has also collapsed and requires reconstruction on the upstream side. The proposal involves constructing a 15 m section of rock armour along the downstream east bank to address scouring at this area. To install the rock armour a dryworks area is to be created using sand bags. Geotextile (terram), granular backfill and stone will be used to form the armour with a toe trench at the base and a plateau at the top, both of 0.9m wide.

Holes in the bridge decks of all five arches are to be assessed with drainage sections to confirm if they are used in conjunction with the drainage system for the road surface. The holes will be filled if it is confirmed that they are not used in conjunction with the road drainage system (OCSC, 2019).

Access to the riverbed for in-stream works will be from the downstream west embankment.

4. RECEIVING ENVIRONMENT

4.1 Background desk study

Monasterevin Bridge is located on the 5th order River Barrow (EPA Segment Code: 14_10474) in the town of Monasterevin in County Kildare where the R445 road crosses the main channel of the Barrow. The bridge is located just upstream of the confluence of the 2nd order Passlands watercourse (EPA Segment Code: 14_1410) with the River Barrow. The EPA monitor biological water quality in this stretch of the River Barrow with a station located on the next bridge upstream (Station Code S14BO11000). This site was rated as being Q3-4 (Moderate) in 2017. This site is located 1km upstream of the subject bridge site. The Monasterevin Waste water Treatment Plant is located on the right bank of the river downstream of Monasterevin Bridge. A NIS for this plant was prepared in 2011 (Ecofact, 2011) and it was concluded that “*the ongoing operation of the WwTP is therefore evaluated as affecting the integrity of the cSAC downstream*”.

Monasterevin Bridge is located within the River Barrow and River Nore SAC. The River Barrow and River Nore SAC (site code 002162) is selected for alluvial wet woodlands and petrifying springs, priority habitats on Annex I of the E.U. Habitats Directive, 1992. The site is also selected as a SAC for old oak woodlands, floating river vegetation, estuary, tidal mudflats, *Salicornia* mudflats, Atlantic salt meadows, Mediterranean salt meadows, dry heath and eutrophic tall herbs, all habitats listed on Annex I of the E.U. Habitats Directive. As well as habitats, the SAC has been selected due to the presence of invertebrate, fish and mammal species which are listed under Annex II of the EU Habitats Directive, including freshwater pearl mussel (*Margaritifera margaritifera* and its hardwater form *M. durrovensis*), freshwater crayfish (*Austropotamobius pallipes*), Atlantic salmon (*Salmo salar*), twaite shad (*Alosa fallax fallax*), the three Irish Lamprey species - sea (*Petromyzon marinus*), brook (*Lampetra planeri*) and river (*Lampetra fluviatilis*), the Desmoulin’s whorl snail *Vertigo moulinsiana* and Eurasian otter (*Lutra lutra*).

The River Barrow rises on the northern slopes of the Slieve Bloom Mountains and flows north and then east past Mountmellick and Portarlinton to Monasterevin. At Monasterevin it turns south and flows through Athy, Carlow, and Leighlinbridge, past Bagenalstown, Goresbridge, Borris, and Graiguenamanagh, before reaching the tide at Saint Mullin’s. The Barrow is about 120 miles long and drains a huge catchment area consisting of mountain, bog, pastureland, and tillage farming. It is a river that has had recurring serious water pollution problems in recent times, and fish kills have



occurred. Some of the tributaries and part of the upper river have had arterial drainage schemes carried out in the past. The history of dredging and modification, in combination with water pollution issues in the River Barrow system, influences the present characteristics of the river. The salmon fishing in the Barrow is generally regarded as poor, and what fish are taken are mostly grilse, taken either during the summer or late in the season (IFI website).

4.1.1 Fish

Inland Fisheries Ireland (IFI) carried out an electrofishing survey of the entire River Barrow Catchment as part of the National Research Survey Programme in 2015, including 35 sites on the main river channel and canal cuts and 118 sites across 21 sub-catchments. In the survey Dace and Roach were found to be widely distributed throughout the main River Barrow channel being recorded at 91% and 80% of sites respectively. Atlantic salmon occurred at 57% of sites surveyed. The numbers of juvenile Atlantic salmon were generally low and that they seemed to be largely confined to fast-flowing, non-navigable areas downstream of weirs, as were Brown Trout which were only recorded at 46% of the main channel sites. Perch were widely distributed in the main channel, recorded at 74% of survey sites, but were poorly represented in the sub-catchments. Pike were also scarce in the sub-catchment watercourses. Although no Bream were recorded in the survey there were Roach x Bream hybrids found in the main channel indicating their presence. Minnow and Gudgeon were widely distributed. European Eel, Stone Loach, Flounder and Three-spined Sticklebacks were also recorded in the 2015 survey.

The IFI survey identified a trend across the Barrow sub-catchments whereby the sub-catchments of the upper area of the Barrow Catchment tended to be assigned a fish status of moderate or less compared to better status in the downstream sub-catchments. The likely cause of the poorer fish stocks is mainly due to poor water quality, poor habitat, barriers impeding migratory fish passage and competition with invasive Dace. In the entire survey of the catchment there were only 5 sites of the 153, that were assessed, i.e. 3% of the survey sites, that had a High fish stock status. More than 50% of the survey sites across the entire Barrow Catchment were recorded as having Moderate or lower fish status. The recurring problems in the Barrow Catchment relating to water quality in the past were also noted in this assessment (Delanty *et. al*, 2017).

The IFI assessment of the Barrow Catchment also stated that a "*high proportion of the negative sites was recorded in tributaries discharging to the River Barrow between Monasterevin and Carlow*" (Delanty *et. al*, 2017).

4.1.2 Water Quality

Monasterevin Bridge is located on the 5th order River Barrow (EPA Segment Code: 14_10474). The EPA monitor biological water quality in this stretch of the River Barrow with a station located on the next bridge upstream (Station Code S14BO11000). This site was rated as being Q3-4 (Moderate) in 2017. This site is located 1km upstream of the subject bridge site.

The EPA's most recent assessment of the River Barrow overall is as follows: "*The Barrow was sampled across 2017 and 2018 due to the outbreak of crayfish plague. Of the 12 stations sampled along the Barrow in 2017, stations 0200, 0780, 1300, 1500, 2900 were in Good ecological condition, while the two uppermost stations maintained High ecological quality (0050 & 0100). A decline to unsatisfactory Moderate quality occurred at Station 1000 (Pass Bridge) and the lowermost station at Graiguenamanagh (3500). In 2018, station 0300 (Twomile Br) improved to High ecological quality, while station 1900 (Tankardstown Br) declined to unsatisfactory Poor quality. The latter site had an overabundance of Potamopyrgus snails and too much instream algae. Station 0700 (Kilnahown Br)*



retained Good ecological quality and stations 0500, 2200, 2455, 2600 and 2680 all remained at unsatisfactory Moderate ecological quality”.

4.1.2.1 Monasterevin WwTP

The Monasterevin Wastewater treatment plant is located to the south west of Monasterevin bridge. The WwTP discharges directly into the River barrow, approximately 200m downstream of Monasterevin Bridge. Additionally, there are multiple storm water overflows in the vicinity of the bridge. During the current surveys records of sewage fungus were noted and there was a sewage pipe noted to the north of the bridge, which is likely to be the storm water overflow for the plant. There is no Annual Environmental Report available for this WwTP.

A NIS for this plant was prepared in 2011 (Ecofact, 2011) and it was concluded that “*the ongoing operation of the WwTP is therefore evaluated as affecting the integrity of the cSAC downstream*”. This report states that there is no assimilative capacity for the current loading of the plant (in 2011), or for future loadings of the plant, in the River Barrow.

The most recent numbers for the plant, from 2015, indicate that the design capacity of the plant is 9,000 p.e. and the actual p.e. is 6,239 p.e. The plant also has tertiary treatment. It appears that the Monasterevin Waste water treatment plant is currently operating within capacity. However, background water quality issues in combination with the impacts of the plant may still be having an impact on the River Barrow and the River Nore SAC.

4.1.3 Other Ecology

According to the Monasterevin Local Area Plan (2016 - 2022); “*substantial areas of high biodiversity value and habitat connectivity are found in Monasterevin. Habitat and landscape features have an important role to play as ecological corridors as they allow for the movement of species, and help to sustain the habitats, ecological processes and functions necessary to enhance and maintain biodiversity.*” The protection of these important habitat and landscape features were emphasised in the LAP and it was noted that development of the town would involve particular attention to the preservation and management of green infrastructure and a requirement for appropriate ecological assessment for all projects was also emphasised. In the Tidy Towns Adjudication Report for Monasterevin in 2018 a score of 72% was awarded for the 'nature and biodiversity' category. Bird boxes and bat boxes introductions in the area were acknowledged as having a significant positive contribution to the locality.

An 'assessment of the distribution and abundance of Kingfisher *Alcedo atthis* and other riparian birds of six SAC river systems in Ireland' (Cummins et. al., 2010), including the River Barrow and River Nore SAC, commissioned by NPWS reported: there were several kingfisher sightings on the Barrow just downstream of Monasterevin. In the section immediately downstream of the town, there are heavily forested areas along the river. In this area there were several sightings and also possible Kingfisher nests recorded. This area was identified as 'Probable' King fisher habitat. Further downstream of this, as far as Dunrally Bridge, was considered 'Possible' Kingfisher habitat with several sightings of the species recorded. The assessment also noted that the bird showed preference for higher, vertical banks which was a likely reason that the numbers of individuals recorded in the sightings was fewer in the Barrow compared to the Nore where there were more suitable river banks in most of surveyed sections. Kingfisher is not a Qualifying Interest of the River Barrow and River Nore SAC.

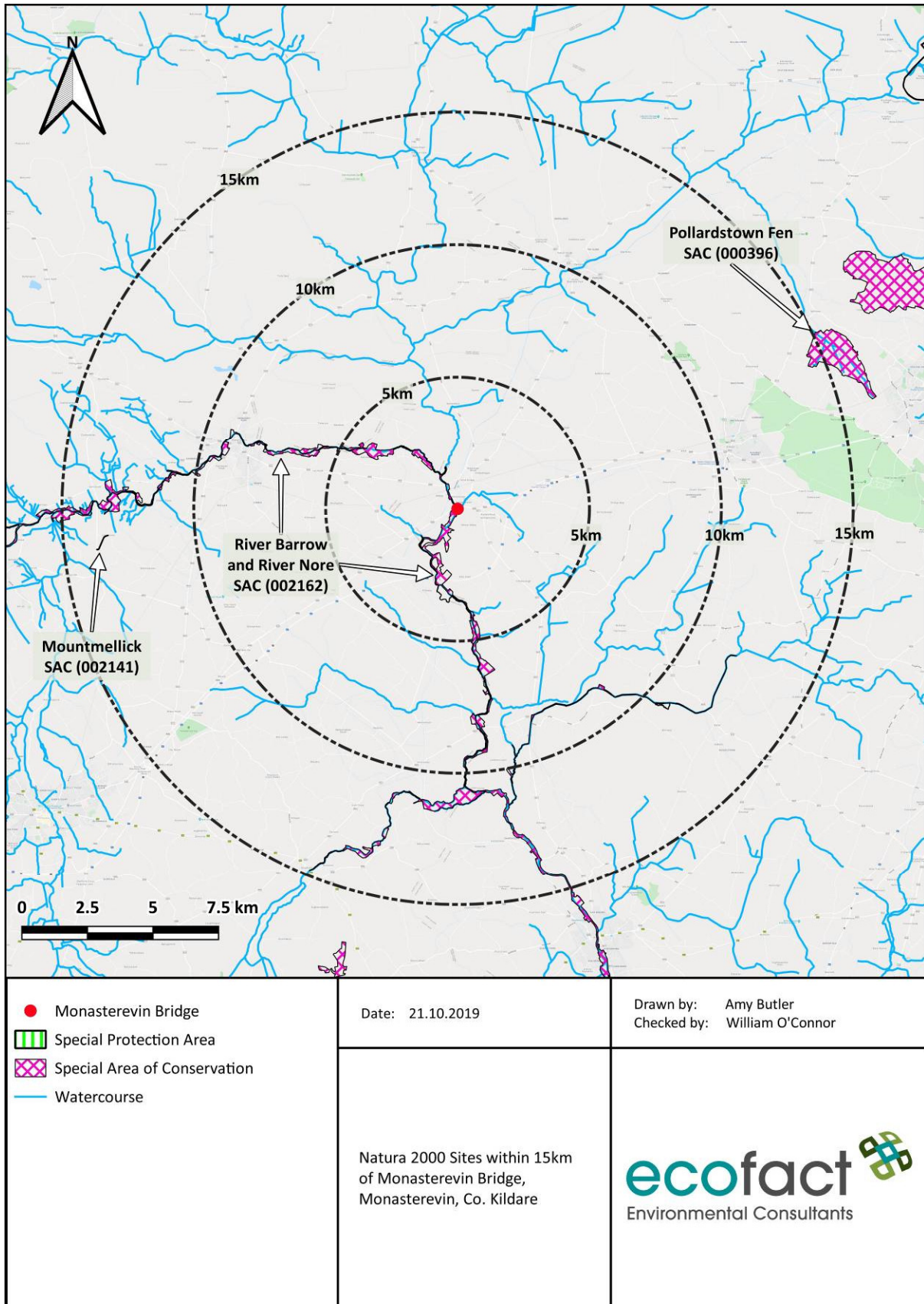


Figure 2 Natura 2000 Sites within 15km of Monasterevin Bridge, Monasterevin, Co. Kildare.



4.2 Description of Natura 2000 sites affected

The River Barrow and River Nore SAC has been identified as being potentially affected by the proposed works (see Screening for Appropriate Assessment Matrix in Appendix 1). The qualifying interests of this site with regard to their presence within the study area and their conservation status are discussed below.

4.2.1 River Barrow and River Nore SAC

The River Barrow and River Nore SAC (site code 002162) is selected for alluvial wet woodlands and petrifying springs, priority habitats on Annex I of the E.U. Habitats Directive, 1992. The site is also selected as a SAC for old oak woodlands, floating river vegetation, estuary, tidal mudflats, *Salicornia* mudflats, Atlantic salt meadows, Mediterranean salt meadows, dry heath and eutrophic tall herbs, all habitats listed on Annex I of the E.U. Habitats Directive. As well as habitats, the SAC has been selected due to the presence of invertebrate, fish and mammal species which are listed under Annex II of the EU Habitats Directive, including freshwater pearl mussel (*Margaritifera margaritifera* and its hardwater form *M. durrovensis*), freshwater crayfish (*Austropotamobius pallipes*), Atlantic salmon (*Salmo salar*), twaite shad (*Alosa fallax fallax*), the three Irish Lamprey species - sea (*Petromyzon marinus*), brook (*Lampetra planeri*) and river (*Lampetra fluviatilis*), the Desmoulin's whorl snail *Vertigo moulinsiana* and Eurasian otter (*Lutra lutra*). The qualifying interests of the River Barrow and Nore SAC are presented in Table 2 and are discussed individually below. The site synopsis for the River Barrow and River Nore SAC is included in Appendix 2. The NPWS details the conservation objectives of the River Barrow and River Nore SAC (NPWS, 2011).

4.2.1.1 Annex I Habitats

The site is a SAC selected for alluvial wet woodlands and petrifying springs which are priority habitats on Annex I of the E.U. Habitats Directive. The site is also selected as an SAC for old oak woodlands, floating river vegetation, estuary, tidal mudflats, *Salicornia* mudflats, Atlantic salt meadows, Mediterranean salt meadows, dry heath and eutrophic tall herb communities, all habitats listed on Annex I of the E.U. Habitats Directive.

A number of the habitats in Table 1 are not considered further due to distance / geographical separation and / or a lack of pathways for effects. Any marine habitats are located over 90km downstream of the proposed works and do not have the potential to be affected at this distance. Therefore, estuaries, mudflats and sandflats not covered by seawater at low tide, reefs, *Salicornia* and other annuals colonising mud and sand, atlantic salt meadows and Mediterranean salt meadows are not discussed further. Annex I habitats and floral species that may occur in the study area are discussed below.

4.2.1.1.1 *Old sessile oak woods with Ilex and Blechnum in the British Isles (91A0)*

This habitat does not occur in the upper section of the River Barrow and/or in the vicinity of Monasterevin Bridge. The habitat occurs along the left bank of the main River Barrow channel upstream of Graiguenamanagh which is c. 80km downstream of Monasterevin. There are also some areas of this woodland habitat in Co. Kilkenny along the River Nore part of the SAC.

When surveyed by Perrin *et al.* in (2008), the area of this habitat was stable or increasing, subject to natural processes. Perrin *et al.* (2008) noted that further un-surveyed areas of this habitat maybe present within the River Barrow and River Nore SAC.



The overall assessment of this habitat has been evaluated as Unfavourable – Bad due to the assessment of three of the four parameters (Area, Structure and Functions, and Future Prospects) as Unfavourable – Bad (NPWS, 2013a).

Table 1 Qualifying interests of the River Barrow and River Nore SAC, their occurrence/potential to occur in the vicinity of Monasterevin Bridge.

	Natura Code	Item Description	Occurring within the proposed works areas
Habitats	91A0	Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	
	91E0	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>)	
	3260	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	
	1310	<i>Salicornia</i> and other annuals colonizing mud and sand	
	1330	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	
	1410	Mediterranean salt meadows (<i>Juncetalia maritimi</i>)	
	4030	European dry heaths	
	7220	Petrifying springs with tufa formation (<i>Cratoneurion</i>)	
	6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	
	1320	<i>Spartina</i> swards (<i>Spartinion maritimae</i>)	
	1140	Mudflats and sandflats not covered by seawater at low tide	
	1170	Reefs	
1130	Estuaries		
Species	1095	Sea lamprey (<i>Petromyzon marinus</i>)	✓
	1096	Brook lamprey (<i>Lampetra planeri</i>)	✓
	1099	River lamprey (<i>Lampetra fluviatilis</i>)	
	1102	Allis shad (<i>Alosa fallax</i>)	
	1106	Atlantic salmon (<i>Salmo salar</i>)	✓
	1103	Twaite shad (<i>Alosa alosa</i>)	
	1355	Otter (<i>Lutra lutra</i>)	✓
	1092 *	White-clawed crayfish (<i>Austropotamobius pallipes</i>)	✓
	1029	Freshwater pearl mussel (<i>Margaritifera margaritifera</i>)	
	1990	Nore Freshwater pearl mussel (<i>Margaritifera durrovensis</i>)	
1016	Desmoulin's whorl snail (<i>Vertigo moulinsiana</i>)		
1421	Killarney Fern (<i>Trichomanes speciosum</i>)		

*White-clawed Crayfish were not present at the site during the current assessment. However, it is included, as this species did normally occur here until the recent introduction of Crayfish plague.

4.2.1.1.2 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) (91E0)

Alluvial Forests are typically woodlands of alder (*Alnus glutinosa*) and ash (*Fraxinus excelsior*), often with willows (*Salix* spp.) and sometimes oak (*Quercus robur*). This habitat occurs in areas subject to periodic flooding along rivers and on lake shores.

This habitat does not occur in the vicinity of the proposed project. The nearest area of this Alluvial forest habitat along the main channel of the Barrow is located just upstream of Athy, more than 20 km downstream of Monasterevin Bridge. There are some more sections of the habitat along the Barrow banks further downstream from this area.

This habitat is evaluated as being of overall 'Bad' conservation status (NPWS 2013a); where the range and area for this habitat are identified as being 'Bad'.



4.2.1.1.3 *Water courses of plain to montane levels with the Ranunculon fluitantis and Callitricho-Batrachion vegetation (3260)*

This Annex I habitat type occurs frequently within the River Barrow, where suitable gradient and flow occurs. "Crowfoot-dominated stretches frequently have low diversity, are of low conservation value and indicate damage. Of greater conservation interest are lowland depositing and tidal rivers and unmodified, fast-flowing, low-nutrient rivers." (NPWS 2013). This habitat does not occur on the low gradient section of the river in the vicinity of Monasterevin Bridge. However, mitigation measures to protect water quality will be in place which will protect downstream habitats.

At a national level the range of floating river vegetation habitat is evaluated as being 'favourable'. However, overall nationally it is evaluated as being of 'inadequate' conservation status (NPWS, 2013a); due to failures in relation to specific structures and functions and also in relation to future prospects, principally in relation to impacts affecting the aquatic environment.

4.2.1.1.4 *European Dry Heath (4030)*

This habitat occurs mainly on the foothills of the Blackstairs Mountains in County Wexford, over 80 km downstream and c. 67km as the crow flies, from Monasterevin Bridge. This habitat does not occur at the proposed site and will not be affected by the works as no potential pathways exist.

This habitat is currently evaluated as being of overall 'Bad', stable conservation status (NPWS 2013a); with the range for this habitat considered 'Favourable' but the area 'Inadequate'.

4.2.1.1.5 *Petrifying Springs with tufa formation (Cratoneurion) (7220)*

The distribution of this habitat in the River Barrow and River Nore SAC is not well known. It has been described at one location on the River Nore channel however, between Thomastown and Inistioge (NPWS, 2011).

This habitat does not occur in the vicinity of the proposed project.

This habitat is evaluated as being stable and of overall 'Inadequate' conservation status (NPWS 2013a); where the range and area of this habitat is identified as being 'Favourable'.

4.2.1.1.6 *Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430)*

The distribution of this Annex I habitat in the River Barrow and River Nore SAC is generally unknown. It is considered to occur in association with some riverside woodlands, on unmanaged islands and in narrow bands along the flood plain of slow-flowing stretches of river (NPWS, 2011). Eutrophic tall herb vegetation occurs in association with various areas of alluvial forest, which are located downstream in the River Barrow and River Nore SAC. The habitat does not occur in the vicinity of the proposed works.

This habitat is evaluated as being stable and of overall 'Bad' conservation status (NPWS 2013a); where the range of this habitat is identified as being 'Good'.

4.2.1.2 Annex II Species

Species listed as qualifying interests of the River Barrow and River Nore SAC and listed on Annex II of the E.U. Habitats Directive include: sea lamprey *Petromyzon marinus*, river lamprey *Lampetra*



fluviatilis, brook lamprey *Lampetra planeri*, freshwater pearl mussel *Margaritifera margaritifera*, Nore freshwater pearl mussel *Margaritifera durrovensis*, white-clawed crayfish *Austropotamobius pallipes*, twaite and allis shad *Alosa fallax* and *Alosa alosa* respectively, Atlantic salmon *Salmo salar*, otter *Lutra lutra*, Desmoulin's whorl snail, *Vertigo moulinsiana* and the Killarney fern *Trichomanes speciosum*.

A number of the species listed in Table 1 are also not considered further due to distance / geographical separation and/or a lack of pathways for effects. Desmoulin's Whorl Snail is located over 80km from the proposed works and no habitat for this species is present in the vicinity of the works. Killarney Fern is not present at this site and the conservation objectives maps show the nearest record as being c. 90km from the works. Freshwater pearl mussels do not occur in the River Barrow and there is not suitable habitat present. Therefore they are not in the vicinity of the proposed project. The relevant species are discussed below.

4.2.1.2.1 Brook lamprey (1096) / River lamprey (1099)

The brook lamprey is the smallest of the three lamprey native to Ireland and it is the only one of the three species that is non-parasitic and spends all its life in freshwater (Maitland & Campbell 1992). All three species of lamprey spawn in fresh waters, and juveniles of all three species, known as ammocoetes, are found within the same catchments, using similar microhabitats, but with varying geographical distribution. Lampreys show a preference for gravel-dominated substratum for spawning, and mainly silt and sand-dominated substratum for nursery habitat (Harvey & Cowx, 2003). The spawning season of brook lampreys starts when the water temperatures reach 10–11°C (Maitland, 2003). This usually occurs in March/April. King (2006) gives the distribution of the three species of lampreys in the River Barrow SAC and found brook lampreys to be sparsely distributed in the main channel of the River Barrow. No lamprey was recorded at the site during the current investigation. However, it is noted that there is potential habitat that may support small numbers of juveniles.

4.2.1.2.2 Sea lamprey (1095)

Sea lamprey (1095) and river lamprey (1099) are anadromous species, spending part of their life cycle in the marine environment and returning to natal watercourses to spawn. Sea and river lampreys are poor swimmers and cannot jump or climb (Reinhardt *et al*, 2009), so will have significant difficulty getting past the main stem weirs on the River Barrow. These species are likely to be generally confined to the lower reaches of the River Barrow. Spawning of river lampreys starts when the water temperature reaches 10–11°C, usually in March and April (Morris & Maitland 1987). The sea lamprey usually spawns in late May or June, when the water temperature reaches at least 15°C (Maitland, 2003).

In the NPWS Irish Wildlife Manuals No. 21 (King, 2006), the sea lamprey is indicated as occurring as far upstream as Carlow on the main channel of the River Barrow. King (2006) notes the presence of river / brook lampreys in the Barrow upstream of Portarlinton. It is considered that these lampreys were most likely brook lampreys, taking account of the distance from the tide and the number of weirs on the river.

Monasterevin is downstream of Portarlinton, but is still also located upstream of the Barrow navigation scheme and a considerable distance from the tidal area. Thus, the fish distribution upstream to this site is therefore affected by weirs and barriers. It is not expected that Sea Lamprey or



River Lamprey would be found at this location. King (2006) recorded no lamprey at Monasterevin during the quantitative fish surveying of the Barrow Channel.

The NPWS (2013b) overall assessment of the conservation status of sea lamprey is 'Bad', with the overall trend in conservation status and the habitat status 'Good'. The status of river lamprey is evaluated as being of 'Favourable' conservation status nationally (NPWS, 2013b).

4.2.1.2.3 *Twaite shad (1103) and Allis shad (1102)*

Twaite Shad (1103) and Allis Shad (1102) are one of the rarest fish species which breed in Irish freshwaters. Shad have an anadromous life cycle and have been recorded in the lower reaches of the River Barrow. The favourable reference range of Twaite shad was calculated based on barriers to upstream migrations. The first impassable barrier was taken to represent the upstream extent of favourable range. On the River Barrow, this was St. Mullins weir (NPWS, 2013b), which is located just above the tidal head in the lower reaches of the River Barrow. Therefore, the site at Monasterevin Bridge is not a Twaite Shad habitat. There is no potential for the presence of Shad in the vicinity of the proposed works.

It is considered that the Allis shad is an opportunistic spawner in Irish waters; and until evidence of an established breeding population is found, the species is considered a vagrant (NPWS, 2013b). The Twaite shad population, although strong in the Barrow, is poor in some rivers and assessed as 'Inadequate' overall. Overall, the status of Twaite shad is considered Inadequate – Bad (NPWS, 2013b).

4.2.1.2.4 *Atlantic salmon (1106)*

Salmon are present throughout the Barrow catchment. The Salmon Conservation Limit (CL) in any river is the number of spawning salmon required to maintain a sustainable population and is used to indicate the number of salmon in a river system above which a harvestable surplus can be considered. Salmon conservation limits are set similarly for all of Ireland's 143 salmon rivers. When the average threshold level of 17 salmon fry is not reached over a four year period, fisheries have been opened for catch and release angling only.

A catchment wide electrofishing survey (CWEF) of juvenile salmon abundance was undertaken on the River Barrow during summer 2011 by Inland Fisheries Ireland staff. CWEF is a method of assessing salmon stocks in the absence of other stock information. This was the fourth year of the CWEF survey in the River Barrow catchment. A total of 79 sites were included in the 2011 analysis. The mean catch in 2011 was 24.75 salmon fry which is considered a high abundance level and is a significant increase on previous years. The mean catch over the four years sampled was 15.35 salmon fry. The River Barrow is below the conservation limit and consequently only catch and release fishing for salmon and sea trout is currently permitted.

There is no potential for salmon spawning at the study site. There is some potential salmon spawning habitat located downstream of the bridge – but in general this is a sluggish river and does not provide suitable spawning and nursery habitat for salmonids.

The conservation status of salmon in the River Barrow is dependent on good water quality status; as this species requires clean water (Q4) for spawning and early life stages. This species is evaluated as being of overall 'Bad' conservation status nationally (NPWS 2013a).



4.2.1.2.5 Otter (1355)

Otter is widespread in the River Barrow and River Nore SAC. Otters have two basic requirements: aquatic prey and safe refuges where they can rest. This species is dependent on fish stocks which are ultimately dependent on water quality. An important component of the otter diet in the study area is White-clawed Crayfish, which until the recent introduction of the Crayfish plague, occurred in this area. No otter holts were found in the vicinity of the proposed works area, however, it is likely that the species still use the site for foraging and commuting. No evidence of Otter activity was found at the site.

The overall assessment of the conservation status of otter is 'Favourable' (NPWS, 2013b).

4.2.1.2.6 White-clawed Crayfish

The River Barrow was a stronghold for White-clawed Crayfish *Austropotamobius pallipes* (Demers *et al.*, 2005). White-clawed Crayfish would normally occur at this location; however, the introduction of the invasive Crayfish plague has resulted in a major loss of Crayfish numbers in the Barrow. There are no Crayfish are currently present at the survey site.

The overall assessment of the conservation status of White-clawed Crayfish is 'Unfavourable Inadequate' (NPWS, 2013b).



5. IMPACT ASSESSMENT

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

5.1 River Barrow and River Nore SAC

5.1.1 Atlantic salmon (1106)

There is no Salmon spawning habitat at the proposed works site. It is noted that there is some potentially suitable spawning habitat (marginal habitat only) downstream of the bridge site.

The instream works have the potential to result in direct water quality and disturbance impacts. Water quality impacts may arise due to an increase in suspended solids, with background levels already high, and accidental spillages of oil / fuel from machinery and / or concrete / cement. It is noted that water quality at the site during the current survey was noted as poor, with evidence of sewage fungus and heavy siltation. Cumulative impacts have the potential to arise in combination with existing background water quality pressures such as the storm water overflow from the Monasterevin WwTP. Instream works may also lead to the creation of a barrier to migration upstream for Atlantic salmon. Mitigation is required to limit the timing of the works to minimise disturbance and ensure that water quality is protected during the works. The instream works must also ensure that there is no barriers for fish, as juvenile salmon are mobile and will move out of the way of machinery provided there is safe access for them.

It is noted that there is a small section of Japanese Knotweed at the site, which can be easily spread to other areas and could impact aquatic habitats in the long term by populating the banks of the river. The de-vegetation works and cutback of overgrowth on the embankments could lead to significant invasive species impacts. Biosecurity mitigation measures are provided to avoid invasive species impacts.

5.1.2 Otter (1355)

No Otter holts are present in the vicinity of the proposed site (to 100m+ upstream and downstream). However, it is likely that otters use this area for foraging and / or commuting. Direct disturbance impacts are not considered to have the potential to be significant as in-stream works will take place during daytime hours when Otters are not active or passing through the site. However, works at the arches could affect otters moving upstream and downstream through the bridge, particularly if multiple arches were worked on and closed at the same time. This would create a barrier to movement for Otters.

Indirect water quality impacts could potentially affect fish populations which are a food source for this species. An increase in suspended solids and accidental spillages of oil / fuel machinery and / or spillages of concrete / cement, if required, could impact on water quality in the River barrow. Cumulative impacts have the potential to arise in combination with existing background water quality



pressures such as the storm water overflow from the Monasterevin WwTP. The Japanese Knotweed present near the site can be easily spread to other areas and could impact aquatic habitats in the long term by populating the banks of the river. The de-vegetation works and cutback of overgrowth on the embankments could lead to significant invasive species impacts. Mitigation measures required include limiting the footprint of the works to minimise disturbance, leaving arches open to maintain accessibility and mitigation to protect water quality and biosecurity.

5.1.3 Lamprey Species (1095, 1096, 1099)

There are some areas at the site which hold suitable lamprey habitat, which consists of silted areas. Although no lampreys have been recorded here, it is considered likely that brook lampreys are present in low densities at the proposed works site. It is unlikely that Sea lampreys and river lampreys would be present here due to the number of barriers to fish migration, i.e. weirs, present downstream along the River barrow. There is no lamprey spawning habitat present at the site. There is potential for direct disturbance impacts arising from the instream works. Juvenile lampreys burrow into silt and can be killed easily by machines tracking over their habitats, or from the regarding works on the river bed for arches 1 and 4. Direct water quality impacts, arising from increased suspended solids or accidental spillages as mentioned above, may also arise. These water quality impacts may also be indirect, affecting further areas downstream. If areas are dewatered, lampreys may become stranded and die. Cumulative impacts have the potential to arise in combination with existing background water quality pressures such as the storm water overflow from the Monasterevin WwTP. Mitigation measures are required to ensure water quality is protected and that there is free and safe passage for lampreys during the works.

The Japanese Knotweed present near the site can be easily spread to other areas and could impact aquatic habitats in the long term by populating the banks of the river. The de-vegetation works and cutback of overgrowth on the embankments could lead to significant invasive species impacts. Mitigation is required to ensure biosecurity is protected.

5.1.4 White-clawed Crayfish (1092)

Reynolds (1998) identifies disease as major threat and has occurred in Ireland even in the absence of alien vectors. The most serious infection is the crayfish fungal plague caused by the fungus *Aphanomyces astaci* Shikora. This disease originated in North America and one strain was spread to Europe via Italy over 100 years ago. Other strains were introduced from California with western American Signal crayfish, and from Louisiana. European crayfish possess no resistance to this fungus, which attaches to thin areas of cuticle as a spore and then grows through the tissues, leading to death in around two weeks. The swimming spores have no resting stage and must be transmitted directly from an infected or recently dead crayfish.

It is known that crayfish plague has already affected the River Barrow. Although Crayfish are not currently present in the vicinity of the site, they have been present in the past and are still a qualifying interest of the River Barrow and River Nore SAC, therefore impacts on this species must be considered. No direct impacts would arise as this species is not present at the site. Potential indirect impacts may arise in relation to water quality. Increased suspended solids and accidental spillages of oil / fuel and / or concrete / cement, if required for the works, can lead to water quality impacts downstream. Cumulative impacts have the potential to arise in combination with existing background water quality pressures such as the storm water overflow from the Monasterevin WwTP. The Japanese Knotweed present near the site can be easily spread to other areas through the de-vegetation works and could impact aquatic habitats in the long term by populating the banks of the river. These impacts may also lead to a reduction of plant habitats for other macroinvertebrates, which



crayfish feed on, and therefore could lead to a further indirect impact on the species. The crayfish plague present in the River barrow at the site could also be transported to other catchments via machinery that has worked on site. Mitigation to protect water quality and biosecurity, to prevent the spread and / or introduction of invasive species and crayfish plague, is required.

5.1.5 Floating River Vegetation

Although floating river vegetation habitat is not present at the site, this habitat may be present downstream in the River barrow and could therefore be impacted by indirect and cumulative water quality impacts. These impacts may arise through the same pathways as mentioned above, i.e. increased suspended solids from instream works and accidental spillages. This habitat may also be impacted by the introduction and / or spread of non-native invasive species. It is noted that there is a small section of Japanese Knotweed at the site, which can be easily spread to other areas, especially through the de-vegetation works. The water quality protection and biosecurity mitigation that is required for the protection of aquatic species would also be sufficient to avoid potential impacts on this Annex I habitat, if present downstream.



6. MITIGATION

6.1 Best practice procedure and guidelines

Mitigation measures for the protection of the riparian and aquatic environment have been prepared for the protection of the conservation interests of the River Barrow and River Nore SAC. The proposed rehabilitation works to Monasterevin bridge have been identified as having the potential to cause direct disturbance and water quality impacts, indirect water quality impacts and non-native invasive species impacts and the spread of crayfish plague as well as cumulative impacts on water quality due to existing background water quality pressures in the River Barrow and Monasterevin Bridge.

The main mitigation measure to be taken is that a site ecologist should be appointed to monitor the works and compliance with the mitigation provided below and detailed in the site-specific method statement. The method statement provides the details of how each process adheres to the mitigation measures: timing of works, limiting access outside of the proposed works area, biosecurity protocols and water quality protection measures. The methodology will be confirmed with the site ecologist for each step of the works to ensure the relevant precautions are taken. The best practice methods included should have due regard to the relevant sections of the following guidelines.

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

6.2 Avoidance

Access to the river for the in-stream bridge works should be limited to a single access route to minimise the footprint of works. This access point will be from the downstream west bank, as stated in the current method statement.

The proposed works will be undertaken outside of the salmonid close season and outside of the lamprey spawning season. The project is scheduled for all works to be completed between July and September. The salmonid close season begins on the 30th of September and therefore works will have to be completed before this date. Works will not be undertaken during dark hours to avoid potential disturbance on Otters or other mammals foraging in the area, with works permitted from 8am to 5pm.

The footprint of the works will be limited and works areas will be surrounded by silt fences and sand bags. Appropriate set back distances from sensitive ecological and cultural heritage sites and the River Barrow will be maintained. The main site compound will not be located within 10 m of the river and will be located on dry land.

The required tree removal will not be undertaken during the bird nesting season, which runs from 1st of March to the 31st of August. Although no suitable nesting habitat for Kingfishers was noted in the



vicinity of the bridge during the current surveys, this habitat may be present downstream and Kingfishers may use this stretch of river for foraging. Free access through at least some arches of the bridge must be provided at all times to allow kingfisher safe passage up through the bridge. It is advised that only one arch at a time should be undergoing works.

6.3 Water Quality Protection

Any oiling or refuelling of machinery that may be required will be undertaken away from the River Barrow. Any oils or fuels that may be required for minor machinery used during the proposed works will be stored appropriately in bunded tanks in the site compound (which should be fenced off 10 m from the river) to ensure no spillages occur. The site compound will have security to deter vandalism, theft and unauthorised access. Machinery will be checked for leaks prior to its use on site and prior to working in-stream.

Prior to any instream works occurring, the site ecologist will agree a 5-day weather window of low flow conditions with the contractor to minimise the risk of works in the river during a flood event. Silt fences will be placed on the outside of the works area first, with sand bags placed inside to ensure no impacts regarding suspended solids arise. Details of the sandbags will be included in the method statement. The site ecologist will ensure the sand bags and silt fences are erected correctly.

The works area will be fenced to avoid trampling or disturbance by personnel outside of the works area or by public access to the site.

An Emergency Contingency Plan will be drawn up for the removal of the sand bags during a flood event, detailing how long the removal of sand bags will take, how it will be done, and what measures will be taken if there is a flood event on a weekend when there are no workers on site. It is noted that the Barrow is a spate river and flood events can happen in a short period of time.

Works should be carried out on a single pier / arch at a time at Monasterevin Bridge. When the works on one pier is complete the works area will be removed appropriately and the normal flow returned before the works area for the next pier is assembled. This will allow flow to be diverted easily and will ensure that any risk posed by a potential flood event will be reduced, as fewer sandbags will need to be removed, and there will be less risk in relation to release of silt into the River Barrow.

The site ecologist will over-see the set-up of dry works areas. Any lamprey and fish species potentially caught behind the dammed area will be translocated upstream by the ecologist who will have obtained a section 14 license for this activity.

No concrete / cement mixing will be carried out at the river bank area; mixing within the mixing area in the site compound will be controlled by the contractor, with all wash water, tool washings and any waste / grey water stored securely and removed; no waste will be stored on site; concrete / cement and grout work must be carried out behind the silt fencing and sandbags, in the dry works area. Storage areas for concrete / cement and grout required for the works will be included in the site compound. The waste from any vegetation removal will also have to be dealt with appropriately away from the River Barrow.

The site ecologist will monitor water ingress and the cleanliness of the works area within the dewatered area. Although works will be undertaken during low water levels, in the unlikely event that a significant ingress of water occurs, all works within the dewatered area will stop. If required, the concrete / cement works will not be undertaken if there is a flow of water into the dewatered section,



taking account of the dewatering volume to be passed through the silt bags at the end of the pumping pipes, if required.

If there is a requirement for pumping out water from the dammed works area silt bags will be installed at the end of the pumping pipes to filter water to be pumped from the dammed section of the river. The specifications of the silt bags required to adequately cope with the volume of water will need to be included in the detailed method statement. The pumping will have to be maintained so it is operating effectively with suspended solids loadings at the end of pipe at less than 10 mg/l and any de-watering, passing through a silt bag should be similar in nature to flood water in the area.

6.4 Biosecurity

Biosecurity measures will follow NRA guidelines *'The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads'* (NRA, 2010) and the IFI guidelines *'Biosecurity Protocol for Field Survey Work'* (IFI, 2010). Japanese Knotweed is present at the site with a stand of the invasive plant located on the left (east) bank just upstream of the bridge. Crayfish plague is also known to occur in the River Barrow.

De-vegetation works and clearance of overgrowth on the embankments is required, which may affect or come into close proximity to the Japanese Knotweed at the site. In any case the small section of Japanese Knotweed is to be eradicated on site prior to the commencement of works. This will prevent the further spread of this invasive plant in the area, and to stop it spreading elsewhere. Common control options for Japanese knotweed include; herbicide treatment screening / sifting, rhizome fragmentation and cultivation, burial on site, root barrier membrane, removal to landfill and biological control.

Particular attention will have to be given to sterilising all equipment / work gear that will come in contact with the river, by using suitable disinfectants such as Virkon aquatic, to ensure no spread of crayfish plague occurs. All equipment to be used on site will be steam cleaned before dispatching to site, and all hired equipment will be treated on site with an approved biocide / cleaning agent. If sand bags are required for the instream works, they will only be sourced from a quarry that has a biosecurity certificate. A disinfection / cleaning station will be set up next to the site compound and 10 m back from the river.

6.5 Site ecologist

A site ecologist will need to be appointed for the duration of the proposed works. The site ecologist will work with the contractor to ensure the precise site-specific method statement complies with relevant mitigation. The method statement includes details of the works: timing / equipment / machinery / materials / procedures etc.. Specific methodology and adherence to mitigation will be confirmed with the ecologist for each individual stage of the project. Overall the ecologist will ensure that the works are carried out following the best practice guidelines and the mitigation measures provided in this document with minimal impacts on the River Barrow and Nore SAC. The ecologist will be on site on a regular basis to ensure compliance with the environmental and ecological protection measures specified in the method statement.

A site induction will be carried out by the site ecologist for all contractors' personnel including sub-contractor staff attending the site. The site induction will ensure that any person working on site is aware of the mitigation measures that will be implemented on site. This will include limiting access to



within the works area, timing of works, water quality protection measures and biosecurity protocols. This will be the first element of the works undertaken.

6.6 Habitat enhancement

It is recommended that a line of random small boulders is placed instream under the outer arches to create habitat for, and improve of, lamprey species and eels.

The removal of trees and vegetation should be minimal. Any trees / shrubs removed to facilitate the works should be replaced when the works are complete. The banks should be reinstated and a native seed mix should be used for replanting. The river should then be fenced off again to protect it from access by farm animals and allow the area to recover.

7. IMPLICATIONS FOR CONSERVATION OBJECTIVES

Favourable conservation status is defined for Annex I habitats and Annex II species in the Habitat Directive (1992):

Article 1 (e)

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

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

Article 1 (i)

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

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

7.1 Conservation Objectives for River Barrow and River Nore SAC

The Conservation Objectives for the River Barrow and River Nore SAC has been prepared by the National Parks and Wildlife Service (NPWS) of the Department of Arts, Heritage and the Gaeltacht (NPWS, 2011). The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and SACs and SPAs are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network. European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.



Site-specific conservation objectives aim to define favourable conservation condition for a particular habitat or species at that site. The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level. Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

In the document outlining the conservation objectives for the River Barrow and River Nore SAC (NPWS, 2011), each conservation interest is discussed separately as a conservation objective. Attributes and targets given in these conservation objectives were based on best available information at the time of writing.

The proposed rehabilitation works at Monasterevin Bridge in the River Barrow have been identified as having the potential for water quality impacts with regard to the requirement for in-stream works and the potential requirement of cement / concrete for the works on the bridge. The implementation of the mitigation measures prescribed for the works will result in these impacts being reduced to imperceptible in scale.

There are no impacts arising from the proposed works which would have the potential to affect the conservation status of the Annex I habitats or Annex II species listed as qualifying interests of the River Barrow and River Nore SAC. The proposed works will not affect the conservation objectives of this site or have an adverse effect on the requirements to meet the conservation objectives with regard to the restoration of Annex I habitats and Annex II species to favourable conservation status. Water quality is identified as a key sensitivity of the water-dependent qualifying interests of the SAC site. Measures to protect water quality to avoid impacts affecting the aquatic species of the SAC have been included in the mitigations section of the current report.

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

With regard to the integrity of the River Barrow and River Nore SAC, this SAC is affected by a history of impacts on water quality and barriers to fish migration, which has direct impacts on the conservation interests of the site. The proposed works are limited in scale and will comply with the required mitigations to ensure that there will be no further impacts arising which would affect the coherence of the SACs ecological structure and function; particularly with regard to the Annex II populations recorded from within the study area. The proposed works are not identified as having the



potential to adversely affect the conservation objectives of the River Barrow and River Nore SAC or with the integrity of the site affected, provided mitigation measures are followed.

8. CONCLUSION STATEMENT

The current NIS has been undertaken to evaluate the potential impacts of the proposed development with regard to the effects upon the conservation objectives and qualifying interests (including habitats and species) of the River Barrow and River Nore SAC. The proposed rehabilitation works at Monasterevin Bridge in Co. Kildare are located on the River Barrow, within the River Barrow and River Nore SAC. The works required involve reconstruction and repairs to piers and outfall pipes, raking and repointing joints in the structure walls, regrading of sections of the river bed, as well as cleaning and removal of vegetation. The road surface of the bridge is also to be relaid.

The works are considered to be limited in scale and a site-specific method statement outlining the procedures to follow, as well as guidance and supervision from an assigned site ecologist will ensure the correct procedures are followed at each stage. The method statement details how the procedures will adhere to the mitigation measures (timing of works, biosecurity protocols and water quality protection measures). The method statement includes details of the river access, overall timeframe of the project, the treatment of machinery, site layout and other pollution prevention precautions. The protection measures will need to be applied to each exact procedure as relevant. There should also be an Emergency Contingency Plan for a flood event drawn up prior to works. In addition, to the inclusion of mitigation in the method statement, ongoing monitoring of the works by the site ecologist will ensure that the correct procedures as detailed in the method statement are adhered to. The ecologist will also carry out lamprey surveying during instream works and will hold a section 14 licence which will permit them to translocate any lamprey which may potentially get caught behind dammed areas. They will also translocate other fish species that may be trapped.

Taking cognisance of the sensitivity of the water-dependent Annex II species listed as qualifying interests of the SAC, mitigations must be implemented at the site during the proposed rehabilitation works at Monasterevin Bridge. The works are to be undertaken outside of the salmonid closed season and lamprey spawning season. Works will also not take place after dark when there is potential to disturb Otter foraging activity. Strict water quality protection measures will be implemented throughout the project to mitigate impacts on all aquatic Annex II species in the affected area, including Atlantic Salmon, Otter, Lamprey. White-clawed crayfish may be present downstream but were not present at the site; it is known that crayfish plague is present in the River Barrow. The only Annex I habitat that may be affected by the proposed works is Floating River Vegetation, which although is not present at the site, may be present downstream and therefore could be impacted by water quality.

Table 2 below provides a summary of the potential impacts, mitigation measures required and potential for residual impacts, for each of the qualifying interests of the River Barrow and River Nore SAC that have the potential to be affected by the proposed works at Monasterevin Bridge.

The provisions of Article 6 of the 'Habitats' Directive 92/43/EC (2000) defines 'integrity' as the 'coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and / or population of species for which the site is or will be classified'. The mitigation measures proposed are considered to be sufficient to ensure that potential impacts regarding water quality, invasive species and disturbance are minimised. From the evidence presented in the current assessment, it is concluded that the potential direct, indirect and cumulative impacts that may arise from the proposed works do not have the potential to affect the integrity of the River Barrow and River Nore SAC.



Table 1 Potential impacts on qualifying interests of the River Barrow and River Nore SAC that have potential to be affected by the proposed works at Monasterevin Bridge, with mitigation measures required and residual impacts identified.

Qualifying Interest	Potential Impact	Mitigation Measures	Residual Impacts
Atlantic Salmon	Juveniles present at the proposed works site; there is the potential for disturbance impacts, invasive species and water quality impacts.	Works will take place outside the salmonid close season; a site ecologist employed for the works; silt fences and sand bags will be used to protect water quality; if pumping is required to dewater the works area silt bags will also be used; the site ecologist will monitor suspended solids downstream of the works; no concrete / cement mixing or refuelling of machinery will take place near any watercourse; site compound not located within 10m of the river;; machinery checked for leaks prior to its use on site; emergency contingency plan for flood events; consider working on one arch at a time to maintain access for aquatic species; Japanese knotweed at site will be eradicated prior to works; biosecurity guidelines will be followed; all equipment / work gear will be sterilised; disinfection / cleaning station set up next to site compound 10m from the river	No residual impacts.
Otter	No holts are present at the site, however Otter are likely to use the site for foraging/commuting; there is the potential for disturbance impacts, invasive species and water quality impacts	Works will not be undertaken during hours of darkness; a site ecologist employed for the works; silt fences and sand bags will be used to protect water quality; if pumping is required to dewater the works area silt bags will also be used; the site ecologist will monitor suspended solids downstream of the works; no concrete / cement mixing or refuelling of machinery will take place near any watercourse; site compound not located within 10m of the river; machinery checked for leaks prior to its use on site; emergency contingency plan for flood events; consider working on one arch at a time to maintain access for aquatic species; Japanese knotweed at site will be eradicated prior to works; biosecurity guidelines will be followed; all equipment / work gear will be sterilised; disinfection / cleaning station set up next to site compound 10m from the river	No residual impacts.
Lamprey Species	Brook lamprey present at the proposed works site in low densities; there is the potential for disturbance impacts, invasive species and water quality impacts	Works will be undertaken outside the lamprey spawning season; site ecologist employed for the works and will hold a section 14 license to translocate lampreys from works areas instream; silt fences and sand bags will be used to protect water quality; if pumping is required to dewater the works area silt bags will also be used; the site ecologist will monitor suspended solids downstream of the works; no concrete / cement mixing or refuelling of machinery will take place near any watercourse; site compound not located within 10m of the river; machinery checked for leaks prior to its use on site; emergency contingency plan for flood events; consider working on one arch at a time to maintain access for aquatic species; Japanese knotweed at site will be eradicated prior to works; biosecurity guidelines will be followed; all equipment / work gear will be sterilised; disinfection / cleaning station set up next to site compound 10m from the river	No residual impacts.
White-clawed Crayfish	Currently not present but it is generally Crayfish habitat, crayfish plague known in the River Barrow;	Site ecologist employed for the works; silt fences and sand bags will be used to protect water quality; if pumping is required to dewater the works area silt bags will also be used; the site ecologist will monitor suspended solids downstream of the works; no concrete / cement mixing or refuelling of machinery will take place near any watercourse; site compound not located within 10m of the river; machinery checked for leaks prior to its use on	No residual impacts.



Qualifying Interest	Potential Impact	Mitigation Measures	Residual Impacts
	there is the potential for water quality impacts	site; emergency contingency plan for flood events; consider working on one arch at a time to maintain access for aquatic species; Japanese knotweed at site will be eradicated prior to works; biosecurity guidelines will be followed; all equipment / work gear will be sterilised; disinfection / cleaning station set up next to site compound 10m from the river	
Floating River Vegetation	Not present at the site but may be present downstream; there is the potential for indirect water quality impacts	Site ecologist employed for the works; silt fences and sand bags will be used to protect water quality; if pumping is required to dewater the works area silt bags will also be used; the site ecologist will monitor suspended solids downstream of the works; no concrete / cement mixing or refuelling of machinery will take place near any watercourse; site compound not located within 10m of the river; machinery checked for leaks prior to its use on site; emergency contingency plan for flood events; consider working on one arch at a time to maintain access for aquatic species; Japanese knotweed at site will be eradicated prior to works; biosecurity guidelines will be followed; all equipment / work gear will be sterilised; disinfection / cleaning station set up next to site compound 10m from the river	No residual impacts.



REFERENCES

CIRIA, (2002). Control of Water Pollution on Construction Sites- Guide to Good Practice (SP156). 6 Storey's Gate, Westminster, London.

CIRIA, (2001). Control of Water Pollution from Construction sites- Guidance for Consultants and Contractors (C532). 6 Storey's Gate, Westminster, London.

CIRIA, (2006). Control of Water Pollution from Linear Construction Projects -Technical Guidance (C649). 6 Storey's Gate, Westminster, London.

CIRIA, (2006). Control of Water Pollution from Linear Construction Projects- Site Guide (C649). 6 Storey's Gate, Westminster, London.

CIRIA, (2005). Environmental Good Practice – Site Guide (C650). 6 Storey's Gate, Westminster, London.

Cummins, S.; Fisher, J.; Gaj McKeever, R.; McNaghten, L.; Crowe, O., (2010). Assessment of the distribution and abundance of Kingfisher *Alcedo atthis* and other riparian birds of six SAC river systems in Ireland.

https://www.npws.ie/sites/default/files/publications/pdf/Cummins_et_al_2010_Kingfisher_survey.pdf

DoEHLG, (2010) 'Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities'. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.

Delanty, K., Kelly, F.L., McLoone, P., Matson, R., O' Briain, R., Gordon, P., Cierpal, D., Connor, L., Corcoran, W., Coyne, J., Feeney, R., Morrissey, E. (2017) Fish Stock Assessment of the River Barrow Catchment 2015. Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24, Ireland.

Ecofact, (2011). Monasterevin Wastewater Treatment Plant: Appropriate Assessment Report for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007). Ecofact Environmental Consultants Ltd, Tait Business Centre, Dominic Street, Limerick City, Ireland.

http://www.epa.ie/licences/lic_eDMS/090151b2803e7061.pdf

EPA, (2015). Inspectors Report on a Waste Water Discharge Licence Application: Monasterevin Town D0177-01. Environmental Protection Agency.

http://www.epa.ie/licences/lic_eDMS/090151b28053284b.pdf

EPA, (2018). Waste Water Discharge Licence Audit Report: Monasterevin Town. D0177-01. Environmental Protection Agency.

http://www.epa.ie/licences/lic_eDMS/090151b2806ca33e.pdf

Harvey J & Cowx I (2003). Monitoring the River, Brook and Sea Lamprey, *Lampetra fluviatilis*, *L. planeri* and *Petromyzon marinus*. Conserving Natura 2000 Rivers Monitoring Series No. 5, English Nature, Peterborough.

IFI, (2010). IFI Biosecurity Protocol for Field Survey Work. Inland Fisheries Ireland, Swords Business Campus, Swords, Co. Dublin, Ireland.



IFI, (2016). Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters. Inland Fisheries Ireland, Swords Business Campus, Swords, Co. Dublin, Ireland.

King, James J. (2006) The status and distribution of lamprey in the River Barrow SAC. Irish Wildlife Manuals No. 21. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Lucey, J. (2006). The pearl mussel, *Margaritifera margaritifera* (L.), in hard water in Ireland. *Biology and Environment: Proceedings of the Royal Irish Academy* 106 B: 143-153.

Maitland PS (2003). Ecology of the River, Brook and Sea Lamprey. Conserving Natura 2000 Rivers. Ecology Series No. 5. English Nature, Peterborough.

NPWS (2013a) The Status of EU Protected Habitats and Species in Ireland. Habitat Assessments Volume 2. Version 1.0. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

NPWS (2013b) The Status of EU Protected Habitats and Species in Ireland. Species Assessments Volume 3, Version 1.0. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

NPWS (2011) Conservation Objectives: River Barrow and River Nore SAC 002162. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NRA, (2008). Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes. National Roads Authority, St Martin's House, Waterloo Roads, Dublin 4.

NRA, (2010). Guidelines on the Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads. National Roads Authority, St Martin's House, Waterloo Roads, Dublin 4.

OCSC (2019). Preliminary Remedial Works Report for Monasterevin Bridge Rehabilitation Works.

OCSC (2020). Remediation Methodology: Monasterevin Bridge Remediation (Project K424).

Perrin, P.; Martin, J.; Barron, S.; O'Neill, F.; McNutt, K.; Delaney, A., (2008). National Survey of Native Woodlands 2003-2008. Vol. II: Woodland Classification

Reynolds, J. D. (1998). Conservation management of the white-clawed crayfish *Austropotamobius pallipes*. Irish Wildlife Manuals No. 1. Dúchas, the Heritage Service, Dublin.

Tidy Towns Competition (2018). Adjudication Report.

https://www.tidytowns.ie/u_reports/2018/kildare/2018-County-Kildare-Monasterevin-379.pdf



PLATES



Plate 1 Monasterevin bridge viewed from downstream.



Plate 2 River Barrow downstream of Monasterevin bridge.



Plate 3 River Barrow looking upstream from Monasterevin bridge.

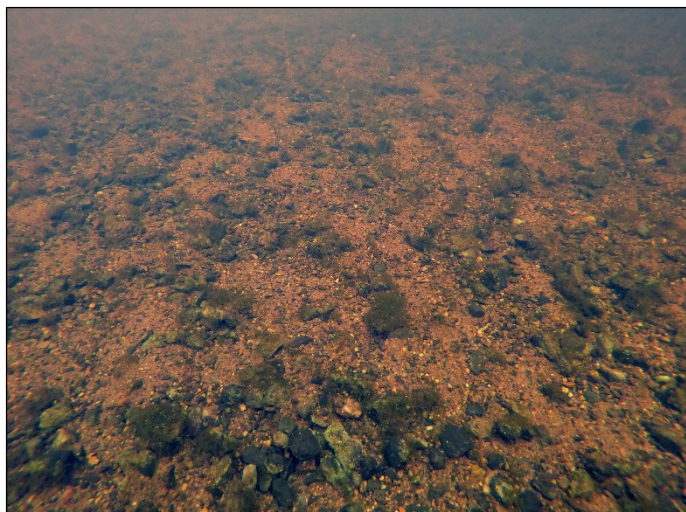


Plate 4 Example of substrate at bridge site – dominated by sand with cobbles. This is not a salmonid or lamprey spawning area and is also a sub-optimal habitat for juvenile lampreys.

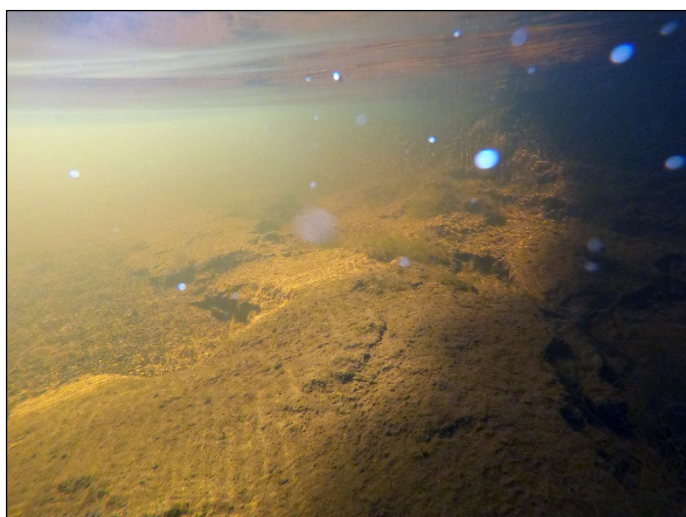


Plate 5 Example of substrate at bridge site – heavy siltation. No juvenile lampreys were present here (sampled by kick sampling) but low densities of juvenile lampreys are likely to be present.



Plate 6 Eutrophication and siltation in the river upstream of Monasterevin Bridge.



Plate 7 Silt plumes visible in the river at the site.



Plate 8 Sewage inlet flowing over litter and debris into the Barrow channel on the upstream left bank.



Plate 9 Japanese knotweed *Fallopia japonica* upstream of the site on the left bank.



Plate 10 Dredging works at Monasterevin in the 1930s. This is the stretch of river immediately upstream of the subject bridge (Source: Irish Waterways History).



Plate 11 Dredging works at Monasterevin in the 1930s. This entire stretch of river was dredged and channelised and the effects of this scheme are still apparent today (Source: Irish Waterways History).

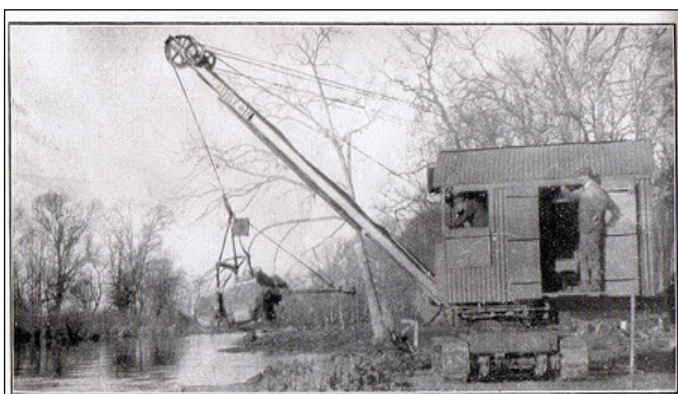


Plate 12 Dredging works at Monasterevin in the 1930s. The dredging works were undertaken using drag lines and the river was also diverted and dried out during the works. This scheme permanently altered the physical character the river (Source: Irish Waterways History).



APPENDIX 1 Screening for Appropriate Assessment Matrix

<p>Brief Description of the Project or Plan</p>	<p>The proposed project relates to remediation works on Monasterevin Bridge. Monasterevin Bridge is a five-arch bridge along which the main road in Monasterevin in County Kildare crosses over the main channel of the River Barrow. The limestone square cut, masonry arch structure is supported by two Masonry abutments and four Masonry piers. The work that is required involves both in-stream and out-of-stream works on the walls of the structure itself, as well as on the embankments and the surface of the bridge.</p>
<p>Brief Description of the Natura 2000 Sites within 15km</p>	<p>River Barrow and River Nore SAC (002162): This site consists of the freshwater stretches of the Barrow and Nore River catchments as far upstream as the Slieve Bloom Mountains, and it also includes the tidal elements and estuary as far downstream as Creadun Head in Waterford. This site is of special conservation interest for a variety of aquatic species and habitats, as well as some terrestrial and marine habitats and species. <u>Included in the current Screening:</u> Yes – Monasterevin Bridge is located over the River Barrow, there is a direct pathway for potential impacts.</p> <p>Pollardstown Fen SAC (000396): Pollardstown Fen is situated on the northern margin of the Curragh of Kildare, approximately 3 km north-west of Newbridge. It lies in a shallow depression, running in a north-west/south-east direction. About 40 springs provide a continuous supply of water to the fen. These rise chiefly at its margins, along distinct seepage areas of mineral ground above the fen level. The continual inflow of calcium-rich water from the Curragh, and from the limestone ground to the north, creates waterlogged conditions which lead to peat formation. There are layers of calcareous marl in this peat, reflecting inundation by calcium-rich water. This peat-marl deposit reaches some 6 m at its deepest point and is underlain by clay. <u>Included in the current Screening:</u> No – this site is located c. 14.3km from Monasterevin Bridge. There is no potential pathway for impacts. There is no hydrological connection with this SAC.</p> <p>Mountmellick SAC (002141): This site comprises a disused stretch of the Grand Canal between Dangan’s Bridge and Skeagh Bridge, approximately 3 km east of Mountmellick in Co. Laois. The whorl snail <i>Vertigo moulinsiana</i> is a glacial relict with a disjunct European population that is considered Vulnerable due to loss of habitat, caused in particular by drainage of wetlands. It was first recorded at this site in 1971. This site is selected for the special conservation interest of Desmoulin’s Whorl Snail. <u>Included in the current Screening:</u> No – this site is located c. 13.3km from Monasterevin Bridge. There is no potential pathway for impacts. There is no hydrological connection with this SAC.</p> <p>No SPAs within 15km of the proposed development. Only the River Barrow and River Nore SAC has a potential pathway for impacts.</p>
<p>Potential Impacts that May Arise</p>	<p>Direct impacts may arise that could affect sea lamprey, river lamprey, brook lamprey, atlantic salmon, otter and crayfish. It is noted that no lampreys were recorded during the current surveys or in previous surveys, however there are considered to be present in low densities. There is no salmon spawning habitat at the site. Juvenile salmon may be present and adult salmon may occasionally pass through the site. No Otter signs were found during the current surveys upstream or downstream of the bridge and no otter holts are present. White-clawed crayfish used to be present at the site but were not recorded during the current surveys due to the outbreak of crayfish plague. Indirect impacts may arise regarding water quality and non-native invasive species. Japanese knotweed is present upstream of the bank on the left hand side. Cumulative impacts may also arise regarding invasive species and water quality. The River channel has a history of channelization and instream works, the river is uniform but also highly silted. There is also a storm water outflow for the Monasterevin WwTP upstream of the bridge, the primary discharge for this plant is located downstream.</p>
<p>Conclusion</p>	<p>The potential for impacts on the River Barrow and River Nore SAC has been identified. The proposed bridge site is located over the River Barrow. There is potential for direct, indirect and cumulative impacts to arise as a result of the works. Mitigation will be required. In a pre-assessment Screening, mitigation cannot be provided. Therefore, a Natura Impact Statement is required for the proposed remedial works in Monasterevin.</p>

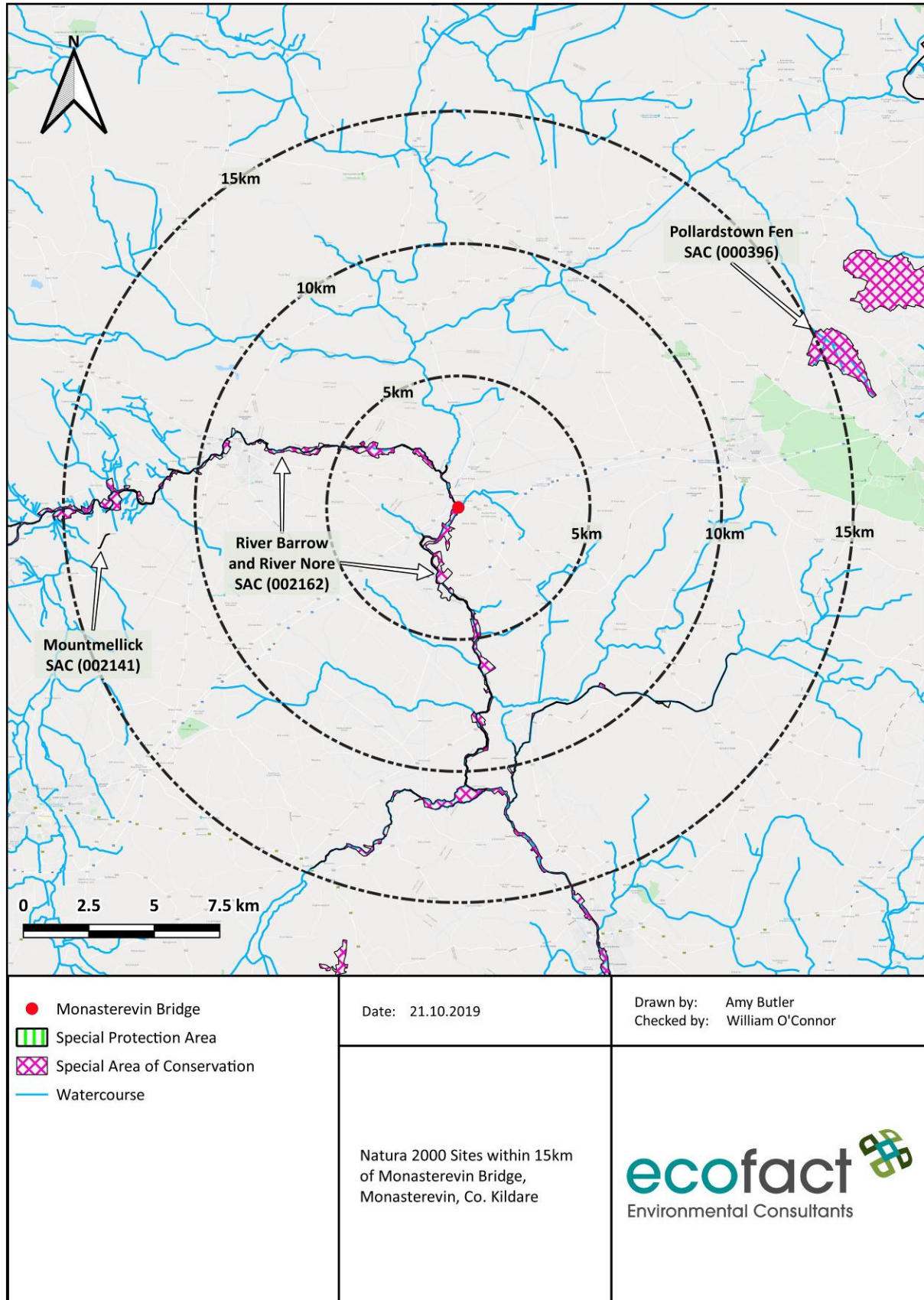


Figure A1.1 Natura 2000 sites within 15km of Monasterevin Bridge, Co Kildare.



APPENDIX 2 NPWS Site Synopses

Site name: River Barrow and River Nore SAC
Site code: 002162

Qualifying interests:

Annex I habitats

- Estuaries (1130)
- Tidal Mudflats and Sandflats (1140)
- Reefs (1170)
- *Salicornia* Mud (1310)
- Atlantic Salt Meadows (1330)
- Mediterranean Salt Meadows (1410)
- Floating River Vegetation (3260)
- Dry Heath (4030)
- Hydrophilous Tall Herb Communities (6430)
- Petrifying Springs* (7220)
- Old Oak Woodlands (91A0)
- Alluvial Forests* (91E0)

Annex II species

- Desmoulin's Whorl Snail (*Vertigo moulinsiana*) (1016)
- Freshwater Pearl Mussel (*Margaritifera margaritifera*) (1029)
- White-clawed Crayfish (*Austropotamobius pallipes*) (1092)
- Sea Lamprey (*Petromyzon marinus*) (1095)
- Brook Lamprey (*Lampetra planeri*) (1096)
- River Lamprey (*Lampetra fluviatilis*) (1099)
- Twaite Shad (*Alosa fallax*) (1103)
- Atlantic Salmon (*Salmo salar*) (1106)
- Otter (*Lutra lutra*) (1355)
- Killarney Fern (*Trichomanes speciosum*) (1421)
- Nore Freshwater Pearl Mussel (*Margaritifera durrovensis*) (1990)

This site consists of the freshwater stretches of the Barrow and Nore River catchments as far upstream as the Slieve Bloom Mountains, and it also includes the tidal elements and estuary as far downstream as Creadun Head in Waterford. The site passes through eight counties – Offaly, Kildare, Laois, Carlow, Kilkenny, Tipperary, Wexford and Waterford. Major towns along the edge of the site include Mountmellick, Portarlinton, Monasterevin, Stradbally, Athy, Carlow, Leighlinbridge, Graiguenamanagh, New Ross, Inistioge, Thomastown, Callan, Bennettsbridge, Kilkenny and Durrow. The larger of the many tributaries include the Lerr, Fushoge, Mountain, Aughavaud, Owenass, Boherbaun and Stradbally Rivers of the Barrow, and the Delour, Dinin, Erkina, Owveg, Munster, Arrigle and King's Rivers on the Nore.

Both rivers rise in the Old Red Sandstone of the Slieve Bloom Mountains before passing through a band of Carboniferous shales and sandstones. The Nore, for a large part of its course, traverses limestone plains and then Old Red Sandstone for a short stretch below Thomastown. Before joining the Barrow it runs over intrusive rocks poor in silica. The upper reaches of the Barrow also run through limestone. The middle reaches and many of the eastern tributaries, sourced in the Blackstairs Mountains, run through Leinster Granite. The southern end, like the Nore runs over intrusive rocks



poor in silica. Waterford Harbour is a deep valley excavated by glacial floodwaters when the sea level was lower than today. The coast shelves quite rapidly along much of the shore.

Good examples of alluvial forest (a priority habitat on Annex I of the E.U. Habitats Directive) are seen at Rathsnagadan, Murphy's of the River, in Abbeyleix estate and along other shorter stretches of both the tidal and freshwater elements of the site. Typical species seen include Almond Willow (*Salix triandra*), White Willow (*S. alba*), Rusty Willow (*S. cinerea* subsp. *oleifolia*), Crack Willow (*S. fragilis*) and Osier (*S. viminalis*), along with Iris (*Iris pseudacorus*), Hemlock Water-dropwort (*Oenanthe crocata*), Wild Angelica (*Angelica sylvestris*), Thin-spiked Wood-sedge (*Carex strigosa*), Pendulous Sedge (*C. pendula*), Meadowsweet (*Filipendula ulmaria*), Common Valerian (*Valeriana officinalis*) and the Red Data Book species Nettle-leaved Bellflower (*Campanula trachelium*).

A good example of petrifying springs with tufa formations occurs at Dysart Wood along the Nore. This is a rare habitat in Ireland and one listed with priority status on Annex I of the E.U. Habitats Directive. These hard water springs are characterised by lime encrustations, often associated with small waterfalls. A rich bryophyte flora is typical of the habitat and two diagnostic species, *Palustriella commutata* and *Eucladium verticillatum*, have been recorded.

The best examples of old oak woodlands are seen in the ancient Park Hill woodland in the estate at Abbeyleix; at Kyleadohir, on the Delour, Forest Wood House, Kylecorragh and Brownstown Woods on the Nore; and at Cloghristic Wood, Drummond Wood and Borris Demesne on the Barrow, though other patches occur throughout the site. Abbeyleix Woods is a large tract of mixed deciduous woodland which is one of the only remaining true ancient woodlands in Ireland. Historical records show that Park Hill has been continuously wooded since the 16th century and has the most complete written record of any woodland in the country. It supports a variety of woodland habitats and an exceptional diversity of species including 22 native trees, 44 bryophytes and 92 lichens. It also contains eight indicator species of ancient woodlands. Park Hill is also the site of two rare plants, Nettle-leaved Bellflower and the moss *Leucodon sciuroides*. The rare Myxomycete fungus, *Licea minima* has been recorded from woodland at Abbeyleix.

Oak woodland covers parts of the valley side south of Woodstock and is well developed at Brownsford where the Nore takes several sharp bends. The steep valley side is covered by oak (*Quercus* spp.), Holly (*Ilex aquifolium*), Hazel (*Corylus avellana*) and Downy Birch (*Betula pubescens*), with some Beech (*Fagus sylvatica*) and Ash (*Fraxinus excelsior*). All the trees are regenerating through a cover of Bramble (*Rubus fruticosus* agg.), Foxglove (*Digitalis purpurea*), Great Wood-rush (*Luzula sylvatica*) and Broad Buckler-fern (*Dryopteris dilatata*).

On the steeply sloping banks of the River Nore, about 5 km west of New Ross, in Co. Kilkenny, Kylecorragh Woods form a prominent feature in the landscape. This is an excellent example of relatively undisturbed, relict oak woodland with a very good tree canopy. The wood is quite damp and there is a rich and varied ground flora. At Brownstown, a small, mature oak dominated woodland occurs on a steep slope. There is younger woodland to the north and east of it. Regeneration throughout is evident. The understory is similar to the woods at Brownsford. The ground flora of this woodland is developed on acidic, brown earth type soil and comprises a thick carpet of Bilberry (*Vaccinium myrtillus*), Heather (*Calluna vulgaris*), Hard Fern (*Blechnum spicant*), Common Cow-wheat (*Melampyrum pratense*) and Bracken (*Pteridium aquilinum*).

Borris Demesne contains a very good example of a semi-natural broadleaved woodland in very good condition. There is quite a high degree of natural regeneration of oak and Ash through the woodland. At the northern end of the estate oak species predominate. Drummond Wood, also on the Barrow,



consists of three blocks of deciduous woods situated on steep slopes above the river. The deciduous trees are mostly oak species. The woods have a well-established understory of Holly, and the herb layer is varied, with Bramble abundant. The whitebeam *Sorbus devoniensis* has also been recorded here.

Eutrophic tall herb vegetation occurs in association with the various areas of alluvial forest and elsewhere where the floodplain of the river is intact. Characteristic species of the habitat include Meadowsweet, Purple Loosestrife (*Lythrum salicaria*), Marsh Ragwort (*Senecio aquaticus*), Ground Ivy (*Glechoma hederacea*) and Hedge Bindweed (*Calystegia sepium*). Indian Balsam (*Impatiens glandulifera*), an introduced and invasive species, is abundant in places.

Floating river vegetation is well represented in the Barrow and in the many tributaries of the site. In the Barrow the species found include water-starworts (*Callitriche* spp.), Canadian Pondweed (*Elodea canadensis*), Bulbous Rush (*Juncus bulbosus*), water-milfoils (*Myriophyllum* spp.), the pondweed *Potamogeton x nitens*, Broad-leaved Pondweed (*P. natans*), Fennel Pondweed (*P. pectinatus*), Perfoliated Pondweed (*P. perfoliatus*) and crowfoots (*Ranunculus* spp.). The water quality of the Barrow has improved since the vegetation survey was carried out (EPA, 1996).

Dry heath at the site occurs in pockets along the steep valley sides of the rivers especially in the Barrow Valley and along the Barrow tributaries where they occur in the foothills of the Blackstairs Mountains. The dry heath vegetation along the slopes of the river bank consists of Bracken and Gorse (*Ulex europaeus*) with patches of acidic grassland vegetation. Additional typical species include Heath Bedstraw (*Galium saxatile*), Foxglove, Common Sorrel (*Rumex acetosa*) and Creeping Bent (*Agrostis stolonifera*). On the steep slopes above New Ross the Red Data Book species Greater Broomrape (*Orobanche rapum-genistae*) has been recorded. Where rocky outcrops are shown on the maps Bilberry and Great Wood-rush are present. At Ballyhack a small area of dry heath is interspersed with patches of lowland dry grassland. These support a number of clover species, including the legally protected Clustered Clover (*Trifolium glomeratum*) - a species known from only one other site in Ireland. This grassland community is especially well developed on the west side of the mud-capped walls by the road. On the east of the cliffs a group of rock-dwelling species occur, i.e. English Stonecrop (*Sedum anglicum*), Sheep's-bit (*Jasione montana*) and Wild Madder (*Rubia peregrina*). These rocks also support good lichen and moss assemblages with *Ramalina subfarinacea* and *Hedwigia ciliata*.

Dry heath at the site generally grades into wet woodland or wet swamp vegetation lower down the slopes on the river bank. Close to the Blackstairs Mountains, in the foothills associated with the Aughnabrisky, Aughavaud and Mountain Rivers there are small patches of wet heath dominated by Purple Moor-grass (*Molinia caerulea*) with Heather, Tormentil (*Potentilla erecta*), Carnation Sedge (*Carex panicea*) and Bell Heather (*Erica cinerea*).

Salt meadows occur at the southern section of the site in old meadows where the embankment has been breached, along the tidal stretches of in-flowing rivers below Stokestown House, in a narrow band on the channel side of Common Reed (*Phragmites australis*) beds and in narrow fragmented strips along the open shoreline. In the larger areas of salt meadow, notably at Carrickcloney, Ballinlaw Ferry and Rochestown on the west bank; Fisherstown, Alderton and Great Island to Dunbrody on the east bank, the Atlantic and Mediterranean sub types are generally intermixed. At the upper edge of the salt meadow in the narrow ecotonal areas bordering the grasslands where there is significant percolation of salt water, the legally protected species Borrer's Saltmarsh-grass (*Puccinellia fasciculata*) and Meadow Barley (*Hordeum secalinum*) are found. The very rare and also legally protected Divided Sedge (*Carex divisa*) is also found. Sea Rush (*Juncus maritimus*) is also present.



Other plants recorded and associated with salt meadows include Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Sea Couch (*Elymus pycnanthus*), Spear-leaved Orache (*Atriplex prostrata*), Lesser Sea-spurrey (*Spergularia marina*), Sea Arrowgrass (*Triglochin maritima*) and Sea Plantain (*Plantago maritima*).

Glassworts (*Salicornia* spp.) and other annuals colonising mud and sand are found in the creeks of the saltmarshes and at the seaward edges of them. The habitat also occurs in small amounts on some stretches of the shore free of stones.

The estuary and the other E.U. Habitats Directive Annex I habitats within it form a large component of the site. Extensive areas of intertidal flats, comprised of substrates ranging from fine, silty mud to coarse sand with pebbles/stones are present. Good quality intertidal sand and mudflats have developed on a linear shelf on the western side of Waterford Harbour, extending for over 6 km from north to south between Passage East and Creadaun Head, and in places are over 1 km wide. The sediments are mostly firm sands, though grade into muddy sands towards the upper shore. They have a typical macro-invertebrate fauna, characterised by polychaetes and bivalves. Common species include *Arenicola marina*, *Nephtys hombergii*, *Scoloplos armiger*, *Lanice conchilega* and *Cerastoderma edule*. An extensive area of honey-comb worm biogenic reef occurs adjacent to Duncannon, Co. Wexford on the eastern shore of the estuary. It is formed by the polychaete worm *Sabellaria alveolata*. This intertidal *Sabellaria alveolata* reef is formed as a sheet of interlocking tubes over a considerable area of exposed bedrock. This polychaete species constructs tubes, composed of aggregated sand grains, in tightly packed masses with a distinctive honeycomb-like appearance. These can be up to 25cm proud of the substrate and form hummocks, sheets or more massive formations. A range of species are reported from these reefs including: *Enteromorpha* sp.; *Ulva* sp.; *Fucus vesiculosus*; *Fucus serratus*; *Polysiphonia* sp.; *Chondrus crispus*; *Palmaria palmate*; *Coralinus officinalis*; *Nemertea* sp.; *Actinia equine*; *Patella vulgate*; *Littorina littorea*; *Littorina obtusata* and *Mytilus edulis*.

The western shore of the harbour is generally stony and backed by low cliffs of glacial drift. At Woodstown there is a sandy beach, now much influenced by recreation pressure and erosion. Behind it a lagoonal marsh has been impounded which runs westwards from Gaultiere Lodge along the course of a slow stream. An extensive reedbed occurs here. At the edges is a tall fen dominated by sedges (*Carex* spp.), Meadowsweet, willowherbs (*Epilobium* spp.) and rushes (*Juncus* spp.). Wet woodland also occurs.

The dunes which fringe the strand at Duncannon are dominated by Marram (*Ammophila arenaria*) towards the sea. Other species present include Wild Clary/Sage (*Salvia verbenaca*), a rare Red Data Book species. The rocks around Duncannon ford have a rich flora of seaweeds typical of a moderately exposed shore and the cliffs themselves support a number of coastal species on ledges, including Thrift, Rock Samphire (*Crithmum maritimum*) and Buck's-horn Plantain (*Plantago coronopus*).

Other habitats which occur throughout the site include wet grassland, marsh, reedswamp, improved grassland, arable land, quarries, coniferous plantations, deciduous woodland, scrub and ponds.

Seventeen Red Data Book plant species have been recorded within the site, most in the recent past. These are Killarney Fern (*Trichomanes speciosum*), Divided Sedge, Clustered Clover, Basil Thyme (*Acinos arvensis*), Red Hemp-nettle (*Galeopsis angustifolia*), Borrer's Saltmarsh-grass, Meadow Barley, Opposite-leaved Pondweed (*Groenlandia densa*), Meadow Saffron/Autumn Crocus (*Colchicum autumnale*), Wild Clary/Sage, Nettle-leaved Bellflower, Saw-wort (*Serratula tinctoria*), Bird



Cherry (*Prunus padus*), Blue Fleabane (*Erigeron acer*), Fly Orchid (*Ophrys insectifera*), Ivy Broomrape (*Orobanche hederarum*) and Greater Broomrape. Of these, the first nine are protected under the Flora (Protection) Order, 2015. Divided Sedge was thought to be extinct but has been found in a few locations in the site since 1990. In addition plants which do not have a very wide distribution in the country are found in the site including Thin-spiked Wood-sedge, Field Garlic (*Allium oleraceum*) and Summer Snowflake. Six rare lichens, indicators of ancient woodland, are found including *Lobaria laetevirens* and *L. pulmonaria*. The rare moss *Leucodon sciuroides* also occurs.

The site is very important for the presence of a number of E.U. Habitats Directive Annex II animal species including Freshwater Pearl Mussel (both *Margaritifera margaritifera* and *M. m. durrovensis*), White-clawed Crayfish, Salmon, Twaite Shad, three lamprey species – Sea Lamprey, Brook Lamprey and River Lamprey, the tiny whorl snail *Vertigo moulinsiana* and Otter. This is the only site in the world for the hard water form of the Freshwater Pearl Mussel, *M. m. durrovensis*, and one of only a handful of spawning grounds in the country for Twaite Shad. The freshwater stretches of the River Nore main channel is a designated salmonid river. The Barrow/Nore is mainly a grilse fishery though spring salmon fishing is good in the vicinity of Thomastown and Inistioge on the Nore. The upper stretches of the Barrow and Nore, particularly the Owenass River, are very important for spawning.

The site supports many other important animal species. Those which are listed in the Irish Red Data Book include Daubenton's Bat, Badger, Irish Hare and Common Frog. The rare Red Data Book fish species Smelt (*Osmerus eperlanus*) occurs in estuarine stretches of the site. In addition to the Freshwater Pearl Mussel, the site also supports two other freshwater mussel species, *Anodonta anatina* and *A. cygnea*.

Three rare invertebrates have been recorded in alluvial woodland at Murphy's of the River. These are: *Neoascia obliqua* (Order Diptera: Syrphidae), *Tetanocera freyi* (Order Diptera: Sciomyzidae) and *Dictya umbrarum* (Order Diptera: Sciomyzidae). The rare invertebrate, *Mitostoma chrysomelas* (Order Arachnida), occurs in the old oak woodland at Abbeyleix and only two other sites in the country. Two flies (Order Diptera) *Chrysogaster virescens* and *Hybomitra muhlfeldi* also occur at this woodland.

The site is of ornithological importance for a number of E.U. Birds Directive Annex I species, including Greenland White-fronted Goose, Whooper Swan, Bewick's Swan, Bar-tailed Godwit, Peregrine and Kingfisher. Nationally important numbers of Golden Plover and Bar-tailed Godwit are found during the winter. Wintering flocks of migratory birds are seen in Shanahoe Marsh and the Curragh and Goul Marsh, both in Co. Laois, and also along the Barrow Estuary in Waterford Harbour. There is also an extensive autumnal roosting site in the reedbeds of the Barrow Estuary used by Swallows before they leave the country. The old oak woodland at Abbeyleix has a typical bird fauna including Jay, Long-eared Owl and Raven. The reedbed at Woodstown supports populations of typical waterbirds including Mallard, Snipe, Sedge Warbler and Water Rail.

Land use at the site consists mainly of agricultural activities – mostly intensive in nature and principally grazing and silage production. Slurry is spread over much of the area. Arable crops are also grown. The spreading of slurry and fertiliser poses a threat to the water quality of the salmonid river and to the populations of E.U. Habitats Directive Annex II animal species within the site. Many of the woodlands along the rivers belong to old estates and support many non-native species. Little active woodland management occurs. Fishing is a main tourist attraction along stretches of the main rivers and their tributaries and there are a number of Angler Associations, some with a number of beats. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place on the rivers. There is net fishing in the estuary and a mussel bed also. Other recreational activities such as boating, golfing and walking, particularly along the Barrow towpath, are also



popular. There is a golf course on the banks of the Nore at Mount Juliet and GAA pitches on the banks at Inistioge and Thomastown. There are active and disused sand and gravel pits throughout the site. Several industrial developments, which discharge into the river, border the site. New Ross is an important shipping port. Shipping to and from Waterford and Belview ports also passes through the estuary.

The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, over-grazing within the woodland areas, and invasion by non-native species, for example Cherry Laurel (*Prunus laurocerasus*) and Rhododendron (*Rhododendron ponticum*). The water quality of the site remains vulnerable. Good quality water is necessary to maintain the populations of the Annex II animal species listed above. Good quality is dependent on controlling fertilisation of the grasslands, particularly along the Nore. It also requires that sewage be properly treated before discharge. Drainage activities in the catchment can lead to flash floods which can damage the many Annex II species present. Capital and maintenance dredging within the lower reaches of the system pose a threat to migrating fish species such as lamprey and shad. Land reclamation also poses a threat to the salt meadows and the populations of legally protected species therein.

Overall, the site is of considerable conservation significance for the occurrence of good examples of habitats and of populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive. Furthermore it is of high conservation value for the populations of bird species that use it. The occurrence of several Red Data Book plant species including three rare plants in the salt meadows and the population of the hard water form of the Freshwater Pearl Mussel, which is limited to a 10 km stretch of the Nore, add further interest to this site.



APPENDIX 3 METHOD STATEMENT

APPENDIX B BIODIVERSITY ASSESSMENT

Rehabilitation Works at Monasterevin Bridge, Co. Kildare

Biodiversity Assessment



Version: 20th March 2020



Tait Business Centre, Dominic Street, Limerick City, Ireland.
t. +353 61 313519, f. +353 61 414315
e. info@ecofact.ie
w. www.ecofact.ie



TABLE OF CONTENTS

1. INTRODUCTION.....	4
2. METHODOLOGY	6
2.1 Desktop Review.....	6
2.2 Field Survey.....	6
2.2.1 Bat surveys.....	6
2.3 Consultation.....	7
2.4 Evaluation.....	7
3. CHARACTERISTICS OF THE PROPOSED DEVELOPMENT	7
4. RECEIVING ENVIRONMENT	9
4.1 General desk study.....	9
4.2 Designated Areas.....	10
4.2.1 Natura 2000 Sites.....	10
4.2.2 Natural Heritage Areas	10
4.2.3 Other.....	10
4.3 Habitats and Flora	13
4.3.1 Habitats affected	13
4.3.2 Non-native invasive species.....	14
4.4 Fauna.....	14
4.4.1 Non-volant mammals	14
4.4.2 Bats	14
4.4.3 Birds	15
4.4.4 Aquatic Ecology.....	15
4.4.5 Reptiles and Amphibians	17
4.4.6 Terrestrial Macroinvertebrate.....	17
5. POTENTIAL IMPACTS.....	18
5.1 Designated Sites.....	18
5.1.1 Natura 2000	18
5.1.2 Nationally Important Sites.....	18
5.2 Habitats and Flora	18
5.3 Fauna	18
5.3.1 Non-volant mammals	18
5.3.2 Bats	18
5.3.3 Birds	19
5.3.4 Aquatic Ecology.....	19
5.3.5 Reptiles and Amphibians	19
5.3.6 Terrestrial Macroinvertebrates	19
6. MITIGATION MEASURES	20
6.1 Designated Areas.....	20
6.2 Habitats and Flora	20
6.3 Fauna.....	21
6.3.1 Non-volant mammals	21
6.3.2 Bats	21



6.3.3	Birds	21
6.3.4	Aquatic Ecology.....	21
7.	RESIDUAL IMPACTS	24
7.1	<i>Designated Areas</i>	24
7.2	<i>Habitats and Flora</i>	24
7.3	<i>Fauna</i>	24
7.3.1	Non-volant mammals	24
7.3.2	Bats	24
7.3.3	Birds	24
7.3.4	Aquatic Ecology.....	24
REFERENCES.....		25
PLATES		28
APPENDIX 1	CRITERIA USED TO EVALUATE HABITATS AND IMPACTS.....	35
APPENDIX 2	NBDC BIODIVERSITY RECORDS	37



1. INTRODUCTION

Kildare County Council are proposing to carry out rehabilitation works on a road bridge in the town of Monasterevin in County Kildare. The bridge is on the R445 road which crosses the main channel of the River Barrow at the south west side of the town. Figure 1 shows the location of the site of the proposed development in Monasterevin, Co. Kildare. Ecofact were commissioned to survey the study area in order to evaluate the biodiversity receptors present at the site and outline the findings in a report. As the bridge is within the River Barrow and River Nore SAC, a standalone Natura Impact Statement has also been completed for the proposed bridge works, assessing the potential impacts of the proposed works on the River Barrow and River Nore SAC (Ecofact, 2020).

The current report assesses the potential impacts of the proposed development on terrestrial and aquatic flora and fauna (ecology). The aim of the study is to identify features of ecological interest within the proposed development study area that may present constraints to development or where special mitigation is necessary. An evaluation is made of the scientific or conservation value of the sites identified and the potential for adverse impacts affecting designated sites following the implementation of appropriate mitigation at design stage.

This assessment has been prepared with regard to the EPA (2017) '*Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)*', the European Commission (2017b) '*Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report*'. The CIEEM (2016) '*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, and Coastal*', and the National Roads Authority (2009) '*Guidelines for Assessment of Ecological Impacts of National Road Schemes*'.

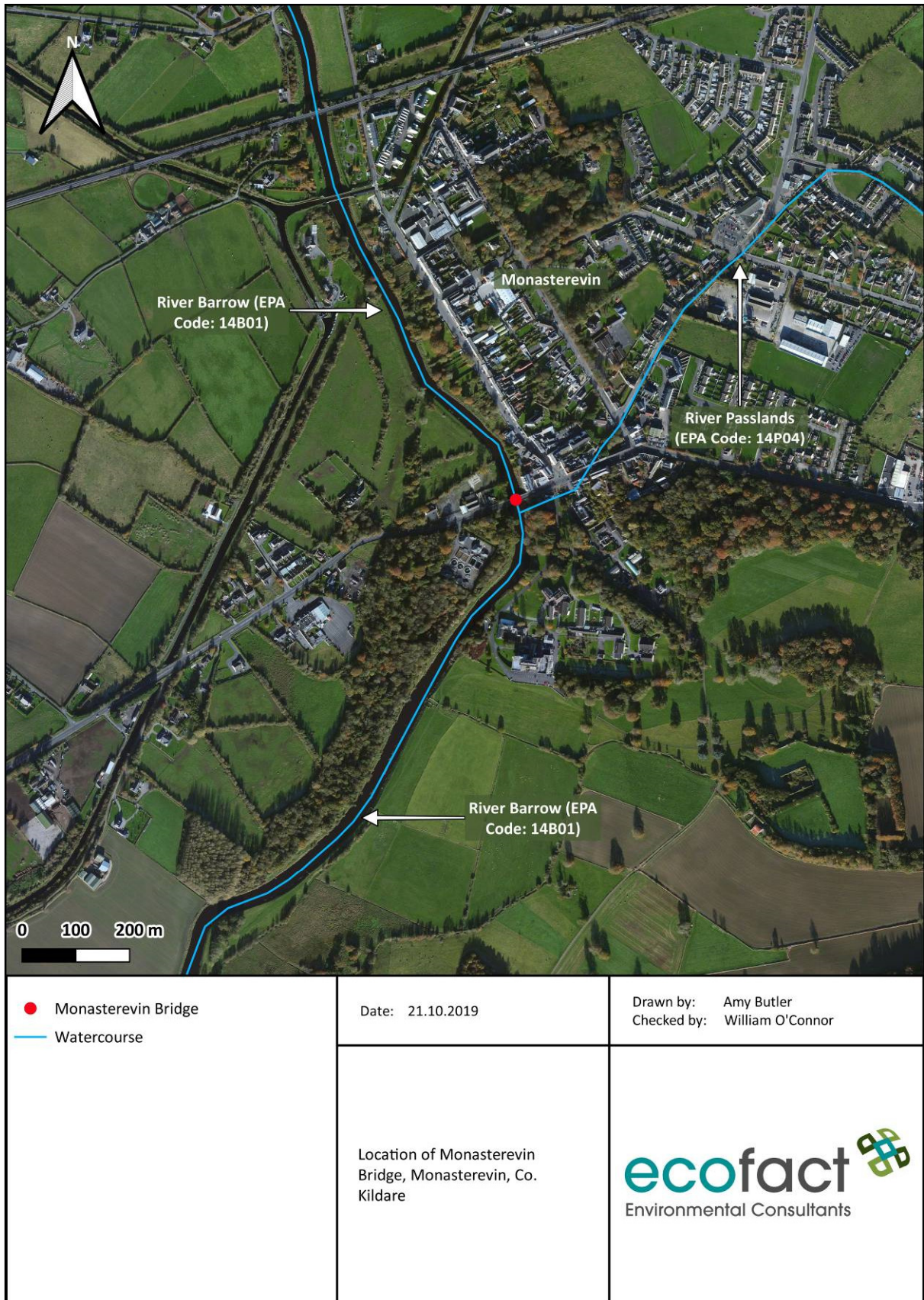


Figure 1 Location of Monasterevin Bridge, Monasterevin, Co. Kildare.



2. METHODOLOGY

2.1 Desktop Review

A desktop review was carried out to identify features of ecological importance within the study area of the proposed bridge works. The desktop review was carried out to collate data on the receiving environment; a range of additional sources of information including scientific reports produced by, and information on the websites of the EPA, NPWS and the IFI were also reviewed. The ecological assessment included designated and sensitive areas in the vicinity of the study area, to enable sufficient assessment to identify and quantify any significant impacts on the habitats, flora and fauna likely to arise from the proposed development.

Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Proposed Natural Heritage Areas (pNHAs) in the vicinity of the proposed development were identified. This information was collated by accessing the NPWS website.

The online database hosted by the Irish National Biodiversity Data Centre (NBDC) (www.biodiversityireland.ie) was also utilized to assess the importance of the study area for mammals and bats. Other sources accessed to gather information on bats in the study area included The Bat Conservation Trust's report '*Distribution Atlas of Bats in Britain and Ireland 1980-1999*' (Richardson, 2000). The '*Irish Red Data Book 2: Vertebrates - Threatened Mammals, Birds, Amphibians and Fish in Ireland*' (Whilde 1993) and the updated '*Irish Red List No. 3: Terrestrial Mammals*' (Marnell *et al.* 2009) were also reviewed.

2.2 Field Survey

Monasterevin Bridge was visited on the 13th to 14th September 2019 to conduct field surveys. These surveys included habitat surveys, mammal survey (including bats), aquatic ecology surveys and bird surveys.

The habitats present on the site were identified following '*A Guide to Habitats in Ireland*' by J.A. Fossitt (2000) and with regard to '*Best Practise Guidance for Habitat Surveying and Mapping*' (Smith *et al.*, 2011).

General protected species surveys were also undertaken to identify any species of ecological importance within the study area. The bridge was surveyed for the presence of otters or other mammals from 100m upstream of the bridge to 100m downstream of the bridge (with other general checks up to 200m). Any evidence of mammal usage was recorded. The bridge was checked for any evidence of bat usage such as droppings, staining or smearing. Any birds or evidence of birds nesting were recorded. Dip net (kick) sampling surveys were undertaken to assess the presence or absence of small fish and lampreys. Habitat in the area was assessed for the potential to have reptile, amphibian or protected terrestrial invertebrate habitat. The flora and fauna at the site were identified and evaluated for ecological importance.

2.2.1 Bat surveys

A formal bat survey was undertaken. Monasterevin Bridge was visited on the 13th September 2019 for an initial daytime bridge assessment where potential crevices were inspected for bats following methodology outlined in '*Bat Mitigation Guidelines for Ireland*' by Kelleher & Marnell (2006), and also following Billington and Norman (1997). Crevices were examined using endoscopes, aided with a step



ladder. All spaces within reach that could potentially allow bats access to the crevices in the bridge were visually examined for bats, signs of bats, or evidence of bat activity, using a torch and borescope where necessary. Cracks, crevices etc. were investigated for ingress / egress points and evidence of bat habitation, such as smearing lines, droppings and staining. Not all crevices could be reached, and these were visually assessed for signs of bats using close-focusing binoculars. Most the higher crevices were damp and are clearly receiving drainage from the road. This renders them generally unsuitable for bat occupation.

An emergence survey was also completed on the evening of the 13th September 2019. This survey extended from one hour before dusk to 1.5 hours after and was completed by two ecologists. Surveyors used visual observations and bat detectors (Bat Box Duets and/or Echo Meter Touch 2 Pro) to assess if bats emerged from the bridge.

2.3 Consultation

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

- National Parks and Wildlife Service (NPWS);
- Inland Fisheries Ireland (IFI);
- Environmental Protection Agency (EPA);
- National Biodiversity Data Centre online database

2.4 Evaluation

The evaluation of impact significance is a combined function of the value of the affected feature (its ecological importance), the type of impact, and the magnitude of the impact. It is therefore necessary to identify the value of ecological features within the study area in order to evaluate the significance and magnitude of possible impacts. Ecological features are assessed on a scale ranging from international-national-county-local. The local scale is approximately equivalent to one 10 km square but can be operationally defined to reflect the character of the area of interest. This scheme is taken from NRA (2009) and is given in Appendix 1.

3. CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Monasterevin Bridge is a five-arch bridge along which the main road (R445) in Monasterevin in County Kildare crosses over the main channel of the River Barrow. The limestone square cut, masonry arch structure is supported by two Masonry abutments and four Masonry piers. The proposed project relates to remediation works of the bridge. The proposed works are outlined in the method statements prepared by O'Connor, Sutton, Cronin Multidisciplinary Consulting Engineers (OCSC, 2019 and 2020). The work that is required involves both in-stream and out-of-stream works on the walls of the structure itself, as well as on the embankments and the surface of the bridge. As stated in the remediation methodology, "*The proposed repair works consists of repointing of the parapets, relaying of the bridge surface, reconstruction of the riverbed under some of the arches, removal of vegetation from embankments and the inclusion of underpinning repairs to the upstream cutwaters of the R445 bridge*" (OCSC, 2020). All works will be complete between July 1st and September 30th 2020.

The road surface on the bridge is currently uneven due to past patch repairs; the proposed works involves planning and resurfacing the road on the bridge, not including the footpaths which are currently in good condition.



De-vegetation and cut-back of overgrowth is required for the upstream and downstream embankments, including the removal of a tree on the upstream east embankment.

Much of the walls of the structure require raking and re-pointing of the joints this includes walls of the parapets (approximately 60%), both upstream and downstream and both river and roadside. It also includes the abutments (approximately 30/40%) and the spandrel walls. Vegetation growth on the structures surfaces and in the joints must also be removed before raking and repointing. Removal and reinstatement of the capping on the parapet walls, both upstream and downstream, will be required in some sections, in order to remove vegetation growing underneath the capping. According to the methodology the masonry surfaces that are undergoing repairs will be cleaned with a high pressure jet to remove dirt, surface deposits and surface vegetation from the structure. Raking may involve the use of plugging chisel and hammer or brushing with a stiff wire brush while keeping surrounding masonry suitably damp and ensuring that there is no weeping flow / pooled water. It is also stated in the methodology that no lime mortar re-pointing will be carried out if temperatures are expected to fall below 5°C within 1 week of this being undertaken. Re-pointing and vegetation removal will be carried out in sections, coinciding with the timing of the underpinning works on each pier to avail of the existing protection measures.

In-stream, the river bed erosion will be addressed by removing debris and re-grading the river bed, under Arch 1 and under Arch 4. Evident scouring on several of downstream piers resulted in the inclusion of scour protection measures in the proposed works. Some piers also require reconstruction or additional repairs as well as the joint raking and re-pointing, including Pier 2 and Pier 3 which are settling away from the bridge, new concrete skirts and masonry cutwater repairs are required. Dry works areas for the works under the bridge will be created with sheet piling. There will be one dry works area in place at any given time, i.e. one pier will be worked on at a time. On completion of one section all debris / material will be removed from the area, any river bed disturbance will be reinstated and the sheet piling will be removed to allow the flow in the channel to return to normal before the next dry works area for the next pier will be prepared. Grouting will be required for some of these in-stream works and silt curtains will be installed to prevent accidental grout entering the water. Some material for the masonry cutwaters and concrete skirt works will be removed and disposed of off-site while some will be stored and used in the reconstruction. Steel dowel bars and sheets are to be drilled through the existing piers. Cast-in-situ concrete will be required for the new concrete skirt.

Reconstruction of an outfall pipe on the east downstream bank which has collapsed will be carried out. The wall at the outfall of a culvert has also collapsed and requires reconstruction on the upstream side. The proposal involves constructing a 15 m section of rock armour along the downstream east bank to address scouring at this area. To install the rock armour a dryworks area is to be created using sand bags. Geotextile (terram), granular backfill and stone will be used to form the armour with a toe trench at the base and a plateau at the top, both of 0.9m wide.

Holes in the bridge decks of all five arches are to be assessed with drainage sections to confirm if they are used in conjunction with the drainage system for the road surface. The holes will be filled if it is confirmed that they are not used in conjunction with the road drainage system (OCSC, 2019).

Access to the riverbed for in-stream works will be from the downstream west embankment.



4. RECEIVING ENVIRONMENT

4.1 General desk study

According to the Monasterevin Local Area Plan (2016 - 2022); "*substantial areas of high biodiversity value and habitat connectivity are found in Monasterevin. Habitat and landscape features have an important role to play as ecological corridors as they allow for the movement of species, and help to sustain the habitats, ecological processes and functions necessary to enhance and maintain biodiversity.*" The protection of these important habitat and landscape features of the town were emphasised in the plan and it was noted that development of the town would involve particular attention to the preservation and management of green infrastructure and a requirement for appropriate ecological assessment for all projects was also emphasised. In 2018, the Tidy Towns Adjudication Report for Monasterevin a score of 72% was awarded for the 'nature and biodiversity' category.

The River Barrow, which is part of the River Barrow and River Nore SAC, flows through the town on the West outskirts. The River Barrow rises on the northern slopes of the Slieve Bloom Mountains and flows north and then east past Mountmellick and Portarlinton to Monasterevin. At Monasterevin it turns south and flows through Athy, Carlow, and Leighlinbridge, past Bagenalstown, Goresbridge, Borris, and Graiguenamanagh, before reaching the tide at Saint Mullin's.

Monasterevin Bridge is located on the 5th order River Barrow (EPA Segment Code: 14_10474) in the town of Monasterevin in County Kildare where the R445 road crosses the main channel of the Barrow. The bridge is located just upstream of the confluence of the 2nd order Passlands watercourse (EPA Segment Code: 14_1410) with the River Barrow. The EPA monitor biological water quality in this stretch of the River Barrow with a station located on the next bridge upstream (Station Code S14BO11000). This site was rated as being Q3-4 (Moderate) in 2017. This site is located 1km upstream of the subject bridge site. The Monasterevin Wastewater Treatment Plant is located on the right bank of the river downstream of Monasterevin Bridge. A NIS for this plant was prepared in 2011 (Ecofact, 2011) and it was concluded that "*the ongoing operation of the WwTP is therefore evaluated as affecting the integrity of the cSAC downstream*".

The EPA's most recent assessment of the River Barrow overall is as follows: "*The Barrow was sampled across 2017 and 2018 due to the outbreak of crayfish plague. Of the 12 stations sampled along the Barrow in 2017, stations 0200, 0780, 1300, 1500, 2900 were in Good ecological condition, while the two uppermost stations maintained High ecological quality (0050 & 0100). A decline to unsatisfactory Moderate quality occurred at Station 1000 (Pass Bridge) and the lowermost station at Graiguenamanagh (3500). In 2018, station 0300 (Twomile Br) improved to High ecological quality, while station 1900 (Tankardstown Br) declined to unsatisfactory Poor quality. The latter site had an overabundance of Potamopyrgus snails and too much instream algae. Station 0700 (Kilnahown Br) retained Good ecological quality and stations 0500, 2200, 2455, 2600 and 2680 all remained at unsatisfactory Moderate ecological quality*".



4.2 Designated Areas

4.2.1 Natura 2000 Sites

Monasterevin Bridge is located within the River Barrow and River Nore SAC. The River Barrow and River Nore SAC (site code 002162) is selected for alluvial wet woodlands and petrifying springs, priority habitats on Annex I of the E.U. Habitats Directive, 1992. The site is also selected as a SAC for old oak woodlands, floating river vegetation, estuary, tidal mudflats, *Salicornia* mudflats, Atlantic salt meadows, Mediterranean salt meadows, dry heath and eutrophic tall herbs, all habitats listed on Annex I of the E.U. Habitats Directive. As well as habitats, the SAC has been selected due to the presence of invertebrate, fish and mammal species which are listed under Annex II of the EU Habitats Directive, including freshwater pearl mussel (*Margaritifera margaritifera* and its hardwater form *M. durrovensis*), freshwater crayfish (*Austropotamobius pallipes*), Atlantic salmon (*Salmo salar*), twaite shad (*Alosa fallax fallax*), the three Irish Lamprey species - sea (*Petromyzon marinus*), brook (*Lampetra planeri*) and river (*Lampetra fluviatilis*), the Desmoulin's whorl snail *Vertigo moulinsiana* and Eurasian otter (*Lutra lutra*).

The qualifying interests of this site with regard to their presence within the study area and their conservation status are discussed in detail in the NIS report for the site (Ecofact, 2020).

4.2.2 Natural Heritage Areas

The only Natural Heritage Area (NHA) in the same 10 km national grid square (N61) as Monasterevin Bridge is the Grand Canal NHA. According to an ecological survey of the Grand Canal, the section of the Barrow Line with the highest diversity was along the stretch that passes Monasterevin.

The canal intersects the Barrow upstream of the site and then runs adjacent to the Barrow channel until it comes into contact with it again in Athy, nearly 20 km downstream of Monasterevin.

4.2.3 Other

There are no SPAs or other designated areas in the surrounding environment that could be impacted by the proposed project. Moore Abbey Woods is currently not a designated site however it has been noted as an important area for nature conservation. This woodland is just over 1 km to the South East of Monasterevin Bridge. The significance of the site for nature and biodiversity was acknowledged in the Tidy Towns Adjudication Report for the town in 2018. It was advised that the town seeks SPA or NHA status for this woodland due to its influence on nature conservation in Monasterevin.

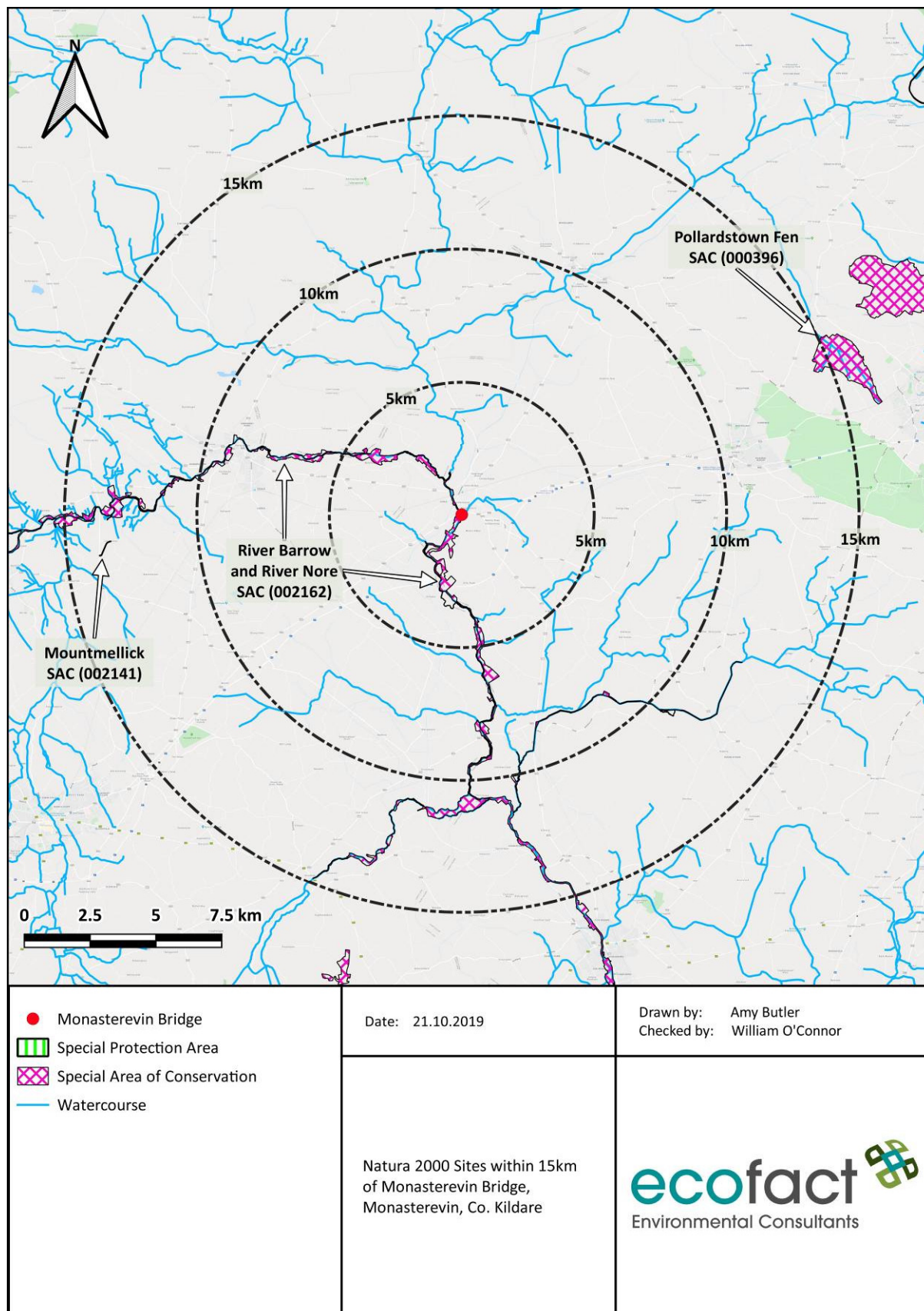


Figure 2 Natura 2000 Sites within 15km of Monasterevin Bridge, Monasterevin, Co. Kildare.

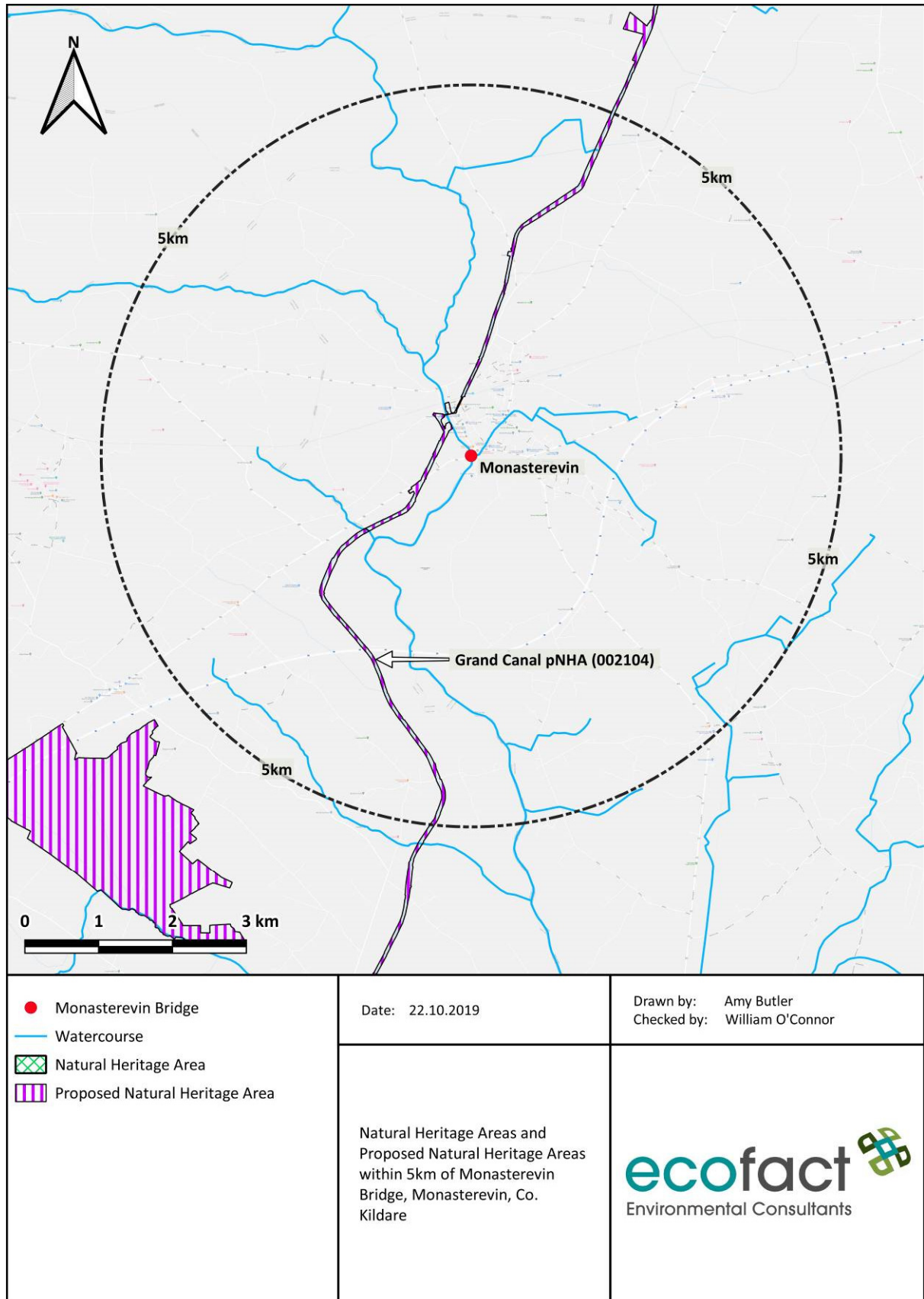


Figure 3 Natural Heritage Areas and Proposed Natural Heritage Areas within 5km of Monasterevin Bridge, Monasterevin, Co. Kildare.



4.3 Habitats and Flora

Monasterevin Town lies to the East of the River Barrow and the proposed bridge works site. Immediately upstream of the Monasterevin Bridge there is an apartment block on the left bank (the East side of the river). There are buildings for approximately 120 m as far as the Monasterevin Fire Station on the left side of the river. Continuing upstream along the left bank from this point the area between the Main Street of Monasterevin and the River widens to a vegetated buffer zone of approximately 50 m consisting of trees and gardens.

On the left bank immediately downstream of the site there is a section of mature trees for approximately 100 m on the left bank. A small road then runs alongside the river into the Moore Abbey Estate buildings with a few trees scattered along the bank between the river and the road. This estate on the left bank then opens into a large area of agricultural land stretching from the river to Moore Abbey Wood for a stretch of more than 500 m before the bank becomes occupied by woodland again.

The right bank upstream of the bridge predominantly consists of wet grassland and trees, which separate the River Barrow from the Grand Canal. Downstream of the bridge the riparian area along the right bank is dominated by trees and woodland for nearly 1 km, before it moves into a large agricultural area.

According to an ecological survey of the Grand Canal, the Barrow Line supports 155 species of vegetation, and the stretch of the line which passes Monasterevin was found to support the greatest diversity. In the same survey of the Grand Canal in 1991, there was an area of calcareous ground identified to the South West of the town of Monasterevin. This calcareous mound was reported as being of significance in terms of biodiversity as it "*supports a very high diversity of species, many of which do not occur elsewhere along the Barrow Line*" (Dromey *et al.* 1991).

4.3.1 Habitats affected

The following habitats have been identified to occur in the vicinity of the subject bridge site. The most important habitat is Depositing Lowland River (FW2) which is the River Barrow channel and is designated within the SAC.

Table 1 Habitats in the vicinity of Monasterevin Bridge and their evaluation.

Habitat Name	Code	Evaluation
Depositing Lowland River (FW2)	FW2	International Importance
Amenity Grassland (Improved)	GA2	Local Importance
Dry Meadows and Grassy verges	GS2	Local Importance
Mixed Broadleaved Woodland	WD1	Local Importance, Higher value
Treelines	WL1	Local Importance
Ornamental/non-native Shrub	WS3	Local Importance
Buildings and Artificial Surfaces	BL3	Local Importance
Earthbanks	BL2	Local Importance



4.3.2 Non-native invasive species

There was a section of Japanese knotweed *Reynoutria japonica* recorded at the site during the survey. The invasive plant was found growing just upstream of Monasterevin Bridge on the left bank.

4.4 Fauna

4.4.1 Non-volant mammals

Badgers *Meles meles*, Otters *Lutra*, Red Squirrels *Sciurus vulgaris*, Hedgehogs *Erinaceus europaeus* and Pygmy Shrews *Sorex minutus* are protected species which have been recorded in the same 10 km grid square (N61) as Monasterevin Bridge is located; as recorded in the National Biodiversity online database (Appendix 1). There were no otter holts or badger setts recorded at the site. The only evidence of non-volant mammals at the site during the assessment was a Mink scat which was found on the right bank of the river. There are no Otter holts or Otter features within 100m+ of Monasterevin Bridge.

4.4.2 Bats

The National Biodiversity Data Centre (NBDC) maps landscape suitability for bats based on Lundy *et al.* (2011). The maps are a visualisation of the results of the analyses based on a 'habitat suitability' index. The index ranges from 0 to 100, with 0 being least favourable and 100 most favourable for bats. Table 2 below gives the suitability of the study area for the bat species found in Ireland (based on NBDC) along with their Irish Red List Status (from Marnell *et al.*, 2009). The overall assessment of bat habitats for the current study area is given as 31.78.

Table 2 Bat Habitat Suitability Assessment – Monasterevin.

Common name	Scientific name	Suitability index	Irish red list status
All bats	-	31.78	
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	41	Least Concern
Brown long-eared bat	<i>Plecotus auritus</i>	42	Least Concern
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	47	Least Concern
Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>	0	Least Concern
Leisler's bat	<i>Nyctalus leisleri</i>	44	Near Threatened
Whiskered bat	<i>Myotis mystacinus</i>	34	Least Concern
Daubenton's bat	<i>Myotis daubentonii</i>	34	Least Concern
Nathusius's pipistrelle	<i>Pipistrellus nathusii</i>	4	Least Concern
Natterer's bat	<i>Myotis nattererii</i>	40	Least Concern

Monasterevin has been acknowledged in the past for its bat population. Bat boxes in the area were noted in the Tidy Towns Adjudication Report (2018) as having contributed positively to the biodiversity in the town. A Bat Walk was organised in the town during Biodiversity Week in 2017, run by Bat Conservation Ireland and, Vincent Wildlife Trust and Irish Wildlife Trust <https://greennews.ie/nine-places-see-bats-biodiversity-week-2017/>. Developmental projects in the town have incorporated benefits to the bat population. For example; the renovation of the 200-year-old Ballykelly Mill saved an important bat roosting site from dereliction and the inevitable loss of the roost habitat. This project also incorporated the addition and improvement of bat landscape/habitat around the roost with native hedgerows development and impact mitigation measures for the construction.

<https://www.kildarenow.com/news/home/471477/council-gives-green-light-for-multi-million-euro-distillery-and-visitor-centre-near-monasterevin.html>



No evidence of bat usage in any of the crevices was recorded during an extensive search using endoscopes on the 13th September 2019. Bats were not found to be present in any of the gaps and crevices in the bridge during the site inspection. The crevices in the bridge walls and piers showed no evidence of bat use; there was no staining or droppings around any potential entrance points and there were undisturbed cobwebs around the gaps and openings. Most of the crevices were either damp, had cobwebs/debris present or were accessible by predators (e.g. rats). However a very small number of individual bat droppings were recorded on flat surfaces underneath the bridge. These were thought to have originated from bats passing upstream and downstream. However, it is possible that some of the higher crevices are used.

A bat emergence survey was completed on the 13th September 2019. This survey was completed by two ecologists located on both sides of the bridge for the duration of the survey (30 minutes before dusk to 1.5 hours after dusk). Three bat species were recorded during the survey; Soprano Pipistrelle, Common Pipistrelle and Daubenton's bat. The activity levels were considered low-moderate and bats were feeding along the river and passing upstream and downstream of the bridge. Pipistrelles (both species) were also recorded feeding around the trees downstream of the bridge. It is possible that some of the bats came from the bridge – but no definite observation of this was made. Any crevice in a bridge could potentially be used by bats – especially individual bats – and bats can use crevices as both day and night roosts. It is clear that Monasterevin Bridge is not a significant bat roost. However, the bridge does have potential for bats. The overall evaluation of Monasterevin Bridge for bats using the Billington and Norman (1997) methodology is 'Crevices possibly used by bats (Grade 1)'. A bat derogation licence and mitigation for bats will be required to work on this bridge – mainly as a precaution.

4.4.3 Birds

According to an 'assessment of the distribution and abundance of Kingfisher *Alcedo atthis* and other riparian birds of six SAC river systems in Ireland' (Cummins *et al.*, 2010), including the River Barrow and River Nore SAC, commissioned by NPWS; There were several kingfisher sightings on the Barrow just downstream of Monasterevin. In the section immediately downstream of the town, there are heavily forested areas along the river. In this area there were several sightings and also possible Kingfisher nests recorded. This area was identified as 'Probable' King fisher habitat. Further downstream of this, as far as Dunrally Bridge, was considered 'Possible' Kingfisher habitat with several sightings of the species recorded. The assessment also noted that the bird showed preference for higher, vertical banks which was a likely reason that the numbers of individuals recorded in the sightings was fewer in the Barrow compared to the Nore where there were more suitable riverbanks in most of surveyed sections.

There were no sightings of Kingfisher during the current survey. There is no potential nesting habitat for this species in the stretch of river immediately upstream and downstream of Monasterevin bridge (to 100m+).

No bird nests were found at Monasterevein Bridge during the current survey.

4.4.4 Aquatic Ecology

Inland Fisheries Ireland (IFI) carried out an electrofishing survey of the entire River Barrow Catchment as part of the National Research Survey Programme in 2015, including 35 sites on the main river channel and canal cuts and 118 sites across 21 sub-catchments. The IFI survey identified a trend across the Barrow sub-catchments whereby the sub-catchments of the upper area of the Barrow



Catchment tended to be assigned a fish status of moderate or less compared to better status in the downstream sub-catchments. The likely cause of the poorer fish stocks is mainly due to poor water quality, poor habitat, barriers impeding migratory fish passage and competition with invasive Dace. In the entire survey of the catchment there were only 5 sites of the 153, that were assessed, i.e. 3% of the survey sites, that had a High fish stock status. More than 50% of the survey sites across the entire Barrow Catchment were recorded as having Moderate or lower fish status. The recurring problems in the Barrow Catchment relating to water quality in the past were also noted in this assessment (Delanty *et al.*, 2017).

In 2015 IFI carried out a catchment wide survey of the River Barrow. Overall non-native Dace were the most common species recorded. Of the sites they surveyed, three sites along the main channel were located very near site 33 in Monasterevin. Pike were very common in this area relative to other places in the main river channel, but general abundance was low. Dace and roach were also common. No brown trout fry were present but brown trout 1+ were present in small numbers (Delanty *et al.*, 2015).

IFI also completed a catchment-wide juvenile lampreys survey of the River Barrow catchment in 2005 (King 2006). The majority of the sites (n=18) surveyed along the main channel yielded negative results, with juvenile lamprey only captured at four locations – two upstream of Monasterevin and two between Monasterevin and Carlow. No juvenile lampreys were recorded at Monasterevin. At those sites where ammocoetes were found, density values were low. Only *Lampetra* spp. Lampreys were recorded. No Sea Lamprey ammocoetes were captured in any of the main channel sites examined. At the time of the survey the site was dominated by coarse fish such as Roach, Dace and Gudgeon. Some Perch and Pike were also recorded and small numbers of Brown Trout.

Only juvenile cyprinids were seen / recorded during the current survey (Minnows and Dace). There is potential for the presence of small numbers of brook lamprey and juvenile salmon at the site. However, habitats are suboptimal. Salmon could potentially use the faster glide habitat downstream of the bridge. However, there is no spawning habitat for salmon or lampreys in the immediate vicinity of Monasterevin bridge.

Ecofact undertook an electrical fishing survey of the main channel of the River Barrow at Monasterevin on behalf of Board na Mona in September 2018 (Ecofact 2019). The site was located upstream of Monasterevin bridge. During this electro-fishing survey, a total of eight fish species recorded. Very low densities of *Lampetra* spp. were recorded, and White-clawed crayfish were also present during the September 2018 survey. However, crayfish have now been lost from this stretch of river due to crayfish plague. Dace were the most numerous species recorded - and Roach and Minnow were recorded in fair numbers. Gudgeon were recorded as present. Also recorded at this site were Perch and Pike in scarce/few numbers. The fisheries status was rated as "Moderate". Ecofact (2019) also assessed chemical water quality at this site in September 2019. Chemical water quality was recorded as "Moderate".

A general kick sampling survey was undertaken during the current survey. Macroinvertebrate family diversity at the was 9. There was one group A species recorded at this site – *Epemera danica*. Group B was represented by damselfly nymphs. There were 6 group C species recorded here. *Gammarus duebeni* were dominant and green chironomids were numerous at this site. Simuliidae larvae and *Baetis rhodani* were present in small numbers. The caseless caddis flies *Hydropsyche siltalai* and *Rhyacophila dorsalis* were present in scarce/few numbers. The group D Isopod *Asellus aquaticus* was present in scarce/few numbers. The group E Bloodworm *Chironomus* sp. was numerous at this site. This site was rated Q3-4. There is an EPA monitoring station (Station code: 14B011000) located 1km



upstream of Monasterevin Bridge. This site was rated Q3-4 in 2017 equivalent to WFD "Moderate Status".

4.4.5 Reptiles and Amphibians

The common frog *Rana temporaria*, smooth newt *Lissotriton vulgaris* and common lizard *Zootoca vivipara* are protected species that have been recorded in the N61 10 km grid square. Frogs and newts tend to use shallow and stagnant water with plentiful algae, usually in ponds and ditches. Although there may be some potential habitat at the edges of the river among the rushes and the algal blooms, in general the species would not use a 5th order channelised river such as the Barrow. The site is not suitable Lizard habitat, which would be mostly bogs and grassland. No reptiles or amphibians were recorded during the September 2019 survey and there is no habitat for these species present – although frogs could possibly occur as in any river, but they would never breed here.

4.4.6 Terrestrial Macroinvertebrate

Several protected invertebrates, including bees, mayfly, butterflies and snails have been recorded in the 10 km grid square that the bridge is located in (N61) (Appendix 1). Potential habitat for invertebrates is present at the site but no invertebrates were recorded at the site during the assessment.



5. POTENTIAL IMPACTS

5.1 Designated Sites

5.1.1 Natura 2000

The River Barrow and River Nore SAC will be affected by the proposed works since the site is within the SAC. These potential impacts have been addressed in the accompanying Natura Impact Statement.

5.1.2 Nationally Important Sites

The Grand Canal NHA is the nearest hydrologically connected NHA but is unlikely to be impacted by the project. The intersection of the Barrow and the canal is at Athy.

5.2 Habitats and Flora

The main impacts on habitats and flora from the proposed project would be in the immediate vicinity of the bridge. Included in the proposed rehabilitation works is the removal of vegetation overgrowth on the bridge structure and within the walls and joints of the structure. The works also involve de-vegetation of embankments and removal of trees at the site, in order to create an access point to the bridge and to carry out the proposed rehabilitation works.

There is potential for the spread of the invasive Japanese knotweed also if the necessary biosecurity measures are not taken.

5.3 Fauna

5.3.1 Non-volant mammals

There is no evidence of mammal use or presence on the banks of the river at the proposed site. There are no Otter holts or other proposed non-volant mammal dwellings present.

Although no Otter holts were found in the vicinity of the proposed works area, it is likely that the species uses the river at the site for foraging and commuting. Direct disturbance impacts during the rehabilitation works at the bridge have the potential to affect the species when active at the site. Works at the arches could affect Otters moving upstream and downstream through the bridge, particularly if multiple arches were worked on and closed at the same time. An increase in suspended solids and accidental spillages of oil / fuel from machinery and / or spillages of concrete / cement, if required, could impact on water quality in the River Barrow. Indirect water quality impacts could potentially affect fish populations which are a food source for the Otter. Therefore, mitigation measures are required to protect water quality and avoid disturbance impacts to this species.

5.3.2 Bats

The proposed project has the potential to adversely affect bats by disturbing a possible bat commuting route during the construction phase. However, these impacts will be short term impacts. The repairing of the bridge and filling of gaps and crevices could potentially impact on bats. There is no evidence that Monasterevin Bridge is used as a bat roost. However, crevices with potential for bats are present and a derogation licence and mitigation for bats will be required.



5.3.3 Birds

Some disturbance impacts during the construction period may impact on birds in the site vicinity. There is no evidence that birds nested in the bridge in 2019. There are no Kingfisher nest sites within 100m+ of the bridge.

5.3.4 Aquatic Ecology

The main issue in relation to the proposed works is the potential adverse impact the construction will have on water quality which can impact significantly on aquatic species. An increase in suspended solids and accidental spillages of oil / fuel from machinery and / or spillages of concrete / cement, if required, could impact significantly on water quality in the River Barrow and therefore on the aquatic ecology at the site as well as downstream.

5.3.5 Reptiles and Amphibians

The proposed works are not affecting important reptile and/or amphibian habitat.

5.3.6 Terrestrial Macroinvertebrates

Altering the riparian area to prepare the site works areas and the access route to the river and bridge, possibly including de-vegetation and excavation will impact to the invertebrates in the area. However, no notable or protected species are present.



6. MITIGATION MEASURES

The main mitigation measure is that a site ecologist will be appointed to monitor the works and compliance with the mitigation provided below and outlined in the site method statement. The method statement provides the details of how each step of the works adheres to the mitigation measures (timing of works, limiting access outside of the proposed works area, biosecurity protocols and water quality protection measures) including the processes, how the areas will be accessed, and equipment will be managed and treated etc.. The methodology will be confirmed with the site ecologist for each step of the works to ensure the relevant precautions are taken. The best practice methods have due regard to the relevant sections of the following guidelines:

- IFI, (2010) *'Biosecurity Protocol for Field Survey Work'*
- IFI, (2016) *'Guidelines of protection of Fisheries during construction works in and adjacent to waters'*
- NRA, (2010) *'The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads'*
- NRA, (2008) *'Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes'*
- CIRIA, (2002) *'Control of Water Pollution from Construction Sites - Guide to Good Practise (SP156)'*
- CIRIA (2001) *'Control of Water Pollution from Construction sites- Guidance for Consultants and Contractors (C532)'*
- CIRIA (2006) *'Control of Water Pollution from Linear Construction Projects -Technical Guidance (C649)'*
- CIRIA (2006) *'Control of Water Pollution from Linear Construction Projects- Site Guide (C649)'*
- CIRIA (2005) *'Environmental Good Practice – Site Guide (C650)'*

Full details of the work programme broken down to each step should also be prepared. It will also be important to have emergency measures planned and drawn up to show how the site can be demobilised in the event of a flood.

6.1 Designated Areas

Water pollution mitigation measures must be put in place to protect both the River Barrow and River Nore SAC. Details of the mitigation for the specific conservation interests of the SAC are provided in the NIS.

6.2 Habitats and Flora

Where possible trees should not be removed – any areas cleared will need to be replanted after works on the bridge are complete. There will be a single access route used to access the river bed for the proposed works. This will help to limit the area and riparian habitat disturbed by the activities.

Biosecurity measures to manage the Japanese knotweed must be taken. The small section of Japanese Knotweed that has been identified at the site will be carefully eradicated prior to the commencement of works. This will prevent the further spread of this invasive plant in the area, and to stop it spreading elsewhere. Common control options for Japanese knotweed include; herbicide



treatment screening/sifting, rhizome fragmentation and cultivation, burial on site, root barrier membrane, removal to landfill and biological control.

6.3 Fauna

6.3.1 *Non-volant mammals*

The time frame of the proposed works should be specified for each arch and included in the site-specific method statement. Regular daylight working hours will be kept for the duration of the project to prevent disturbance of nocturnal mammal activity; in particular, otter foraging.

6.3.2 *Bats*

Access to the potential bat flight route under the bridge will not be blocked during the night to prevent adverse impacts on bat commuting and foraging. In order to carry out the proposed works on the bridge a bat derogation license is required.

It is also important to survey the bridge for bats just prior to the commencement of works. This inspection will be carried out by a qualified ecologist that will check any cracks and crevices for roosting bat. Bat use can change with season and from year to year so it is necessary to ensure that no bats are roosting in the bridge.

6.3.3 *Birds*

Vegetation removal will not take place during the nesting and breeding season (March – August). In accordance with section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000; the cutting, grubbing, burning or destruction by other means of vegetation growing on uncultivated land or in hedges or ditches is restricted during the nesting and breeding season for birds and wildlife.

6.3.4 *Aquatic Ecology*

Strict mitigation measures, as similarly detailed in the NIS report, must be in place and adhered to in order to protect the water quality and thus the aquatic ecology in the River Barrow.

The proposed works will be carried out between July and September as stated in the current method statement. The exact schedule of each stage of works should be specified and included in the detailed method statement prior to commencement. The works will therefore be undertaken before the salmonid close season which begins at the end of September. There is no close season for coarse fish in Ireland but it is recommended to avoid the typical coarse fish spawning period and adhere to the UK coarse fish close season avoiding works at this time (15th March – 15th June). Lamprey spawning season (May – early July) will also be avoided. Works will have to be completed before the end of September.

There will be a bunded storage area in the site compound for any oils or fuels that may be required for minor machinery used during the proposed works to ensure no spillages occur. Any oiling or refuelling of machinery that may be required will be undertaken away from the River Barrow. Machinery will be checked for leaks prior to its use on site and prior to working in-stream. The site compound will have security to deter vandalism, theft and unauthorised access. The site compound will be located at least 10 m back from the river as stated in the current method statement.



The potential for disturbance of bank side soils, debris from the bridge repair works and surface-water run-off will be mitigated for with the placement of sandbags and silt fences within the works areas. Any sandbags used on the site must be clean and be covered in the site biosecurity plan. The sandbags will only be sourced from a quarry that has a biosecurity certificate. The current method statement notes that a disinfection / cleaning station will be set up next to the site compound and at least 10 m back from the river. All equipment will be sterilised with an approved biocide / cleaning agent at this designated area.

Prior to any in-stream works occurring, the site ecologist will agree a 5-day weather window of low flow conditions with the contractor to minimise the risk of works in the river during a flood event. Silt fences will be placed on the outside of the dry works area first, with sandbags placed inside to ensure no impacts regarding suspended solids arise. The type of sandbags used and how the sandbags will be placed will be specified and included in the method statement as agreed with the site ecologist. The site ecologist will mark out the location of the sandbags and silt curtains to be deployed around the works area within the dewatered section of the river during in-stream works. The methods used for dewatering behind sand bagged works areas will also have to be specified. The site ecologist will over-see the set-up of dry works areas. Any lamprey and fish species potentially caught behind the dammed area will be translocated upstream by the ecologist who will have obtained a section 14 license for this activity.

The works area will also be fenced to avoid trampling or disturbance by personnel outside of the works area or by public access to the site. Again, sandbags used for the dewatering of the works areas will be sourced from a pit or quarry with a biosecurity plan to ensure no sand bags have the potential to be vectors for the spread of non-native invasive species, such as Crayfish plague. There should be an Emergency Contingency Plan for the removal of sand bags during a flood event, detailing how long the removal of sand bags will take, how it will be done, and what measures will be taken if there is a flood event on a weekend when there are no workers on site. This plan will be prepared in advance of approval for the works and in advance of works commencing.

No concrete / cement mixing will be carried out at the river bank area; mixing within the mixing area in the site compound will be controlled by the contractor, with all wash water, tool washings and any waste / grey water stored securely on site; no waste will be stored on site; if concrete / cement is required as part of the works, it will be carried out behind the silt fencing and sandbags, in the dry works area. Waste management will be carried appropriately by the contractor in accordance with the site-specific method statement, whereby it will be kept to a minimum and handled, stored and disposed of correctly. The waste includes soil and vegetation removed for the works. Specific storage areas for concrete / cement and grout are also required for the works.

If there is a requirement for pumping out water from the dammed works area silt bags will be installed at the end of the pumping pipes to filter water to be pumped from the dammed section of the river. These silt bags will be specified by the contractor to adequately cope with the volume of water and will be maintained so it is operating effectively with suspended solids loadings at the end of pipe at less than 10mg/l. Any dewatering, passing through a silt bag would be similar in nature to flood water in the area. The pump to be used will need to be specified and included in the method statement as well as what water levels the work will be done under.

On-site monitoring will be undertaken by the site ecologist on a daily basis for the duration of the works to include visual observations of suspended solids or colouring upstream and downstream of the works. If elevated levels of suspended solids are observed, all works at the site must stop and the



source of the elevation identified, methodologies reviewed, and works can only recommence when a solution has been agreed with the site ecologist and the contractor. The silt curtains and sandbags on the site will be inspected daily by the site ecologist and will be repaired and maintained by the contractor as requested.

The site ecologist will monitor water ingress and the cleanliness of the works area within the dewatered area. Although works will be undertaken during low water levels, in the unlikely event that a significant ingress of water occurs, all works within the dewatered area will stop. If required, the concrete / cement works will not be undertaken if there is a flow of water into the dewatered section, taking account of the dewatering volume to be passed through the silt bags at the end of the pumping pipes.

In the event of a flood / emergency situation the Contractor will be required to implement the Emergency Contingency Plan. The method statement should note that the weather is to be checked ahead daily; however it is recommended that the site ecologist will agree a 5-day weather window for the works, as the Barrow is a spate river flood events can happen in a short period of time. The site compound must also be secured with regard to surface water run-off in the event of a significant rainfall event. The containment of the site utilising silt fences will be overseen by the site ecologist in such cases.



7. RESIDUAL IMPACTS

7.1 Designated Areas

No residual impacts.

7.2 Habitats and Flora

Riparian habitat will recover over time and there will be no long term significant negative effect.

7.3 Fauna

7.3.1 Non-volant mammals

There will be no residual impacts as there are no dwellings being interfered with. There will only be temporary disturbance impacts.

7.3.2 Bats

There will be no significant residual impacts on bats.

7.3.3 Birds

In the long term the project will not affect the downstream bird habitats as the works do not involve alterations to the downstream river or its banks and habitats. If water quality protection measures are adhered to during the project there should be no residual impacts on water quality which could affect the fish and thus, the food source of the Kingfisher.

7.3.4 Aquatic Ecology

No residual impacts on aquatic ecology are anticipated if the outlined mitigation is followed.



REFERENCES

Bat Conservation Ireland, (2010). Bats and Waterways: Guidance notes for Planners, engineers and developers. Bat Conservation Ireland

https://www.batconservationireland.org/wp-content/uploads/2013/09/BCI_Guidelines_waterways.pdf

Billington, G.E. & Norman, G. M., (1997). A Report on the survey and conservation of bat roosts in bridges in Cumbria, Kendal. English Nature

<http://publications.naturalengland.org.uk/publication/5454603824922624>

CIRIA, (2002). Control of Water Pollution on Construction Sites- Guide to Good Practice (SP156). 6 Storey's Gate, Westminster, London.

CIRIA, (2001). Control of Water Pollution from Construction sites- Guidance for Consultants and Contractors (C532). 6 Storey's Gate, Westminster, London.

CIRIA, (2006). Control of Water Pollution from Linear Construction Projects -Technical Guidance (C649). 6 Storey's Gate, Westminster, London.

CIRIA, (2006). Control of Water Pollution from Linear Construction Projects- Site Guide (C649). 6 Storey's Gate, Westminster, London.

CIRIA, (2005). Environmental Good Practice – Site Guide (C650). 6 Storey's Gate, Westminster, London.

Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists. Good Practice Guidelines. Bat Conservation Trust, London. <http://www.bats.org.uk/pages/batsurveyguide.html>

CIEEM (2006) Guidelines for Ecological Impact Assessment (EclA). <https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-Sept-2019.pdf>

Department of Housing, Planning and Local Government (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. https://www.housing.gov.ie/sites/default/files/publications/files/guidelines_for_planning_authorities_and_an_bord_pleanala_on_carrying_out_eia_-_august_2018.pdf

Cummins, S.; Fisher, J.; Gaj McKeever, R.; McNaghten, L.; Crowe, O., (2010). Assessment of the distribution and abundance of Kingfisher *Alcedo atthis* and other riparian birds of six SAC river systems in Ireland.

https://www.npws.ie/sites/default/files/publications/pdf/Cummins_et_al_2010_Kingfisher_survey.pdf

Delanty, K., Kelly, F.L., McLoone, P., Matson, R., O' Briain, R., Gordon, P., Cierpal, D., Connor, L., Corcoran, W., Coyne, J., Feeney, R., Morrissey, E. (2017) Fish Stock Assessment of the River Barrow Catchment 2015. Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24, Ireland.

Dromey, Johnston and Keane, 1991. Ecological Survey of the Grand Canal. Part 1: Survey Report.

Ecofact (2019). Bord na Móna Aquatic Ecology Survey 2018. A Report to Bord na Mona, February 2018.



Ecofact (2020). Monasterevin Bridge Rehabilitation Works: Natura Impact Statement.

Ecofact (2011) Monasterevin Wastewater Treatment Plant. Appropriate Assessment Report for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007). http://www.epa.ie/licences/lic_eDMS/090151b2803e7061.pdf

EPA (2017) Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR). <https://www.epa.ie/pubs/advice/ea/drafteiarguidelines.html>

EPA, (2002). '*Guidelines on the information to be contained in Environmental Impact Statements*'. Environmental Protection Agency, Ireland.

EPA, (2003). '*Advice Notes on Current Practice in the preparation of Environmental Impact Statements*'. Environmental Protection Agency, Ireland.

European Commission (2017a) Environmental Impact Assessment of Projects: Guidance on Screening. https://ec.europa.eu/environment/eia/pdf/EIA_guidance_Screening_final.pdf

European Commission (2017b) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report. https://ec.europa.eu/environment/eia/pdf/EIA_guidance_EIA_report_final.pdf

IEEM, (2006). Guidelines for Ecological Evaluation and Assessment. Institute of Ecological and Environmental Management.

IFI, (2010). IFI Biosecurity Protocol for Field Survey Work. Inland Fisheries Ireland, Swords Business Campus, Swords, Co. Dublin, Ireland.

IFI, (2016). Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters. Inland Fisheries Ireland, Swords Business Campus, Swords, Co. Dublin, Ireland.

Kelleher, C. & Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland. <https://www.npws.ie/sites/default/files/publications/pdf/IWM25.pdf>

James J. King (2006) The status and distribution of lamprey in the River Barrow SAC. Irish Wildlife Manuals No. 21. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland. <https://www.npws.ie/sites/default/files/publications/pdf/IWM21.pdf>

Loughlin (2015). Natura Impact Report Draft Monasterevin Local Area Plan.

Lundy, M.G., Aughney, T., Montgomery, W.I., & Roche, N., (2011). Landscape conservation for Irish bats & species specific roosting characteristics. Bat Conservation Ireland. https://www.batconservationireland.org/wp-content/uploads/2013/09/Landscape_Conservation_Irish_Bats.pdf

Marnell, F., Kingston, N. & Looney, D., (2009). Ireland Red List No.3: Terrestrial Mammals, National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.



<https://www.npws.ie/sites/default/files/publications/pdf/RL3.pdf>

NRA (2006b). '*Guidelines for the treatment of bats during the construction of national road schemes*'. National Roads Authority, Parkgate Business Centre, Parkgate Street, Dublin 8, D08 DK10, Ireland.

<http://www.tii.ie/tii-library/environment/construction-guidelines/Guidelines-for-the-Treatment-of-Bats-during-the-Construction-of-National-Road-Schemes.pdf>

NRA (2008a) *Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes*. National Roads Authority, Dublin.

NRA (2008b) *Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes*. National Roads Authority, St Martin's House, Waterloo Roads, Dublin 4.

NRA, (2009) *Guidelines for Assessment of Ecological Impacts of National Road Schemes: Rev. 2*. National Roads Authority, Dublin. <http://www.tii.ie/technical-services/environment/planning/Guidelines-for-Assessment-of-Ecological-Impacts-of-National-Road-Schemes.pdf>

NRA, (2010). *Guidelines on the Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads*. National Roads Authority, St Martin's House, Waterloo Roads, Dublin 4.

OCSC (2019), *Preliminary Remedial Works Report for Monasterevin Bridge Rehabilitation Works*.

OCSC (2020). *Remediation Methodology: Monasterevin Bridge Remediation (Project K424)*.

Tidy Towns Competition (2018). *Adjudication Report*.

https://www.tidytowns.ie/u_reports/2018/kildare/2018-County-Kildare-Monasterevin-379.pdf

Wildlife Act (1976). Section 46: Regulation and control of wildlife dealing.



PLATES



Plate 1 Monasterevin bridge viewed from downstream.



Plate 2 River Barrow downstream of Monasterevin bridge.



Plate 3 River Barrow looking upstream from Monasterevin bridge.



Plate 4 Dredging works at Monasterevin in the 1930s. This is the stretch of river immediately upstream of the subject bridge (Source: Irish Waterways History).

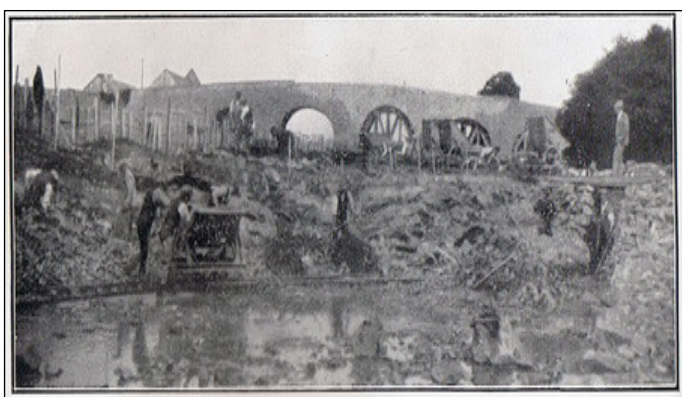


Plate 5 Dredging works at Monasterevin in the 1930s. This entire stretch of river was dredged and channelised and the effects of this scheme are still apparent today (Source: Irish Waterways History).



Plate 6 Dredging works at Monasterevin in the 1930s. The dredging works were undertaken using drag lines and the river was also diverted and dried out during the works. This scheme permanently altered the physical character the river (Source: Irish Waterways History).

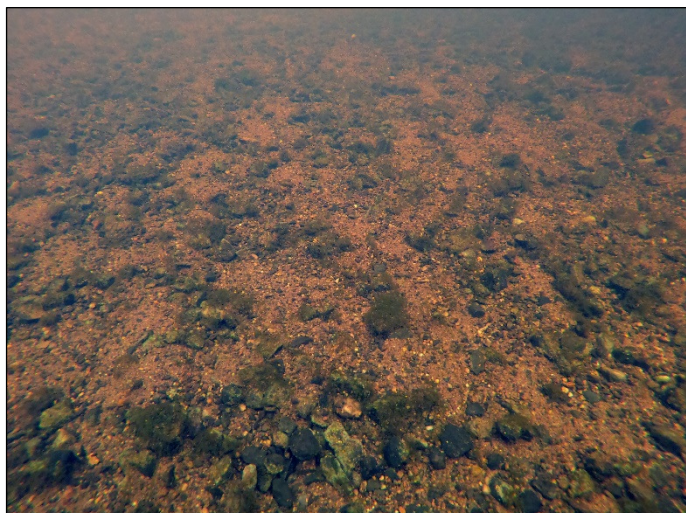


Plate 7 Example of substrate at bridge site – dominated by sand with cobbles. This is not a salmonid or lamprey spawning area and is also a sub-optimal habitat for juvenile lampreys.

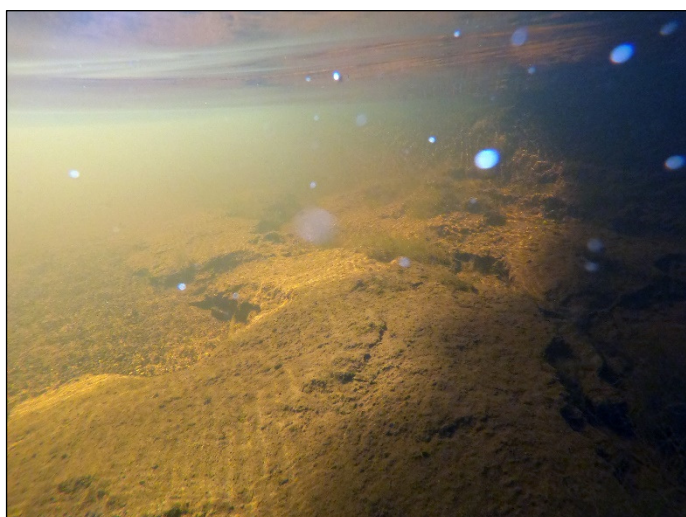


Plate 8 Example of substrate at bridge site – heavy siltation. No juvenile lampreys were present here (sampled by kick sampling) but low densities of juvenile lampreys are likely to be present.



Plate 9 Example of substrate at bridge site – sand dominating. This is sub-optimal juvenile lamprey habitat.



Plate 10 Upstream face of Monasterevin Bridge showing large cracks and spaces in the stonework. Bridge is in obvious need of rehabilitation.



Plate 11 Evidence of previous maintenance works and filling of crevices at Monasterevin Bridge. This has reduced the potential for bats. The crevices present are in the shearwaters and generally low and large; such crevices are also potentially accessible by rats so bats less likely to use them.



Plate 12 Left arch also showing previous filling / repointing. Only crevices at the top of the bridge are wet and seem to be receiving road runoff – making them unsuitable for use by bats.



Plate 13 Large gaps present between stonework – but no evidence of bat usage was found.



Plate 14 Large gaps present between stonework – evidence of old bird nests but these crevices are potentially accessible by rats and this will deter use by bats and birds.



Plate 15 Other large gaps/crevices has extensive webs and debris present – no evidence of usage. All of these crevices were surveyed effectively.



Plate 16 Another large gap/crevice with extensive webs and debris present – no evidence of usage.



Plate 17 Discharge entering the River Barrow at the left bank beside the bridge.



Plate 18 Sewage Fungus apparent in the river downstream of the discharge (previous plate) and under the bridge.



Plate 19 Eutrophication and siltation in the river upstream of Monasterevin Bridge.



Plate 20 Silt plumes visible in the river at the site.



Plate 21 Japanese knotweed *Fallopia japonica* upstream of the site on the left bank.



APPENDIX 1 CRITERIA USED TO EVALUATE HABITATS AND IMPACTS

Table A4.1 Criteria used to determine the value of ecological resources (taken from NRA, 2009).

Criteria	
International Importance	<p>'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation. Proposed Special Protection Area (pSPA). Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). Features essential to maintaining the coherence of the Natura 2000 Network Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. Resident or regularly occurring populations (assessed to be important at the national level) of the following:</p> <ul style="list-style-type: none"> • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. • Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). • World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). • Biosphere Reserve (UNESCO Man & The Biosphere Programme) • Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). • Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). • Biogenetic Reserve under the Council of Europe. • European Diploma Site under the Council of Europe. • Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).
National Importance	<p>Site designated or proposed as a Natural Heritage Area (NHA). Statutory Nature Reserve. Refuge for Fauna and Flora protected under the Wildlife Acts. National Park. Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park. Resident or regularly occurring populations (assessed to be important at the national level) of the following:</p> <ul style="list-style-type: none"> • Species protected under the Wildlife Acts; and/or • Species listed on the relevant Red Data list. • Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.
County Importance	<p>Area of Special Amenity. Area subject to a Tree Preservation Order. Area of High Amenity, or equivalent, designated under the County Development Plan. Resident or regularly occurring populations (assessed to be important at the County level) of the following:</p> <ul style="list-style-type: none"> • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; • Species protected under the Wildlife Acts; and/or • Species listed on the relevant Red Data list. <p>Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance. County important populations of species; or viable areas of semi-natural habitats; or natural heritage features identified in the National or Local BAP; if this has been prepared. Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.</p>



Criteria	
Local Importance (higher value)	<p>Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared; Resident or regularly occurring populations (assessed to be important at the Local level) of the following:</p> <ul style="list-style-type: none"> • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; • Species protected under the Wildlife Acts; and/or • Species listed on the relevant Red Data list. <p>Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;</p> <ul style="list-style-type: none"> • Sites or features containing common or lower value habitats, including naturalised species that are essential in maintaining links and ecological corridors between features of higher ecological value.
Local Importance	<p>Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;</p> <p>Sites or features containing non-native species that are of some importance in maintaining habitat links.</p>

Table A.2 Criteria for assessing impact magnitude (NRA, 2009).

Impact magnitude	Definition
No change:	No discernible change in the ecology of the affected feature.
Imperceptible Impact:	An impact capable of measurement but without noticeable consequences.
Slight Impact:	An impact which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Impact:	An impact that alters the character of the environment that is consistent with existing and emerging trends.
Significant Impact:	An impact which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Profound Impact:	An impact which obliterates sensitive characteristics.



APPENDIX 2 NBDC BIODIVERSITY RECORDS

Protected and Threatened Species (Grid Square: N61)

Group	Species	Scientific name	Designation
Amphibian	Common Frog	<i>Rana temporaria</i>	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
Amphibian	Smooth Newt	<i>Lissotriton vulgaris</i>	Protected Species: Wildlife Acts
Bird	Barn Owl	<i>Tyto alba</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Bird	Barn Swallow	<i>Hirundo rustica</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Black-headed Gull	<i>Larus ridibundus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Bird	Common Grasshopper Warbler	<i>Locustella naevia</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Common Kingfisher	<i>Alcedo atthis</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Common Linnet	<i>Carduelis cannabina</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Common Pheasant	<i>Phasianus colchicus</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
Bird	Common Snipe	<i>Gallinago gallinago</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List



Group	Species	Scientific name	Designation
Bird	Common Starling	<i>Sturnus vulgaris</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Common Swift	<i>Apus apus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Common Wood Pigeon	<i>Columba palambus</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
Bird	Corn Bunting	<i>Emberiza calandra</i>	Protected Species: Wildlife Acts
Bird	Corn Cuckoo	<i>Crex crex</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Bird	Dunlin	<i>Calidris alpina</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Eurasian Curlew	<i>Numenius arquata</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Bird	Eurasian Teal	<i>Anas crecca</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Eurasian Woodcock	<i>Scolopax rusticola</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of



Group	Species	Scientific name	Designation
			Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	European Golden Plover	<i>Pluvialis apricaria</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Bird	Great Cormorant	<i>Phalacrocorax carbo</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Hen Harrier	<i>Circus cyaneus</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Herring Gull	<i>Larus argentatus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Bird	House Martin	<i>Delichon urbicum</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	House Sparrow	<i>Passer domesticus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Lesser Black-backed Gull	<i>Larus fuscus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Little Grebe	<i>Tachybaptus ruficollis</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Mallard	<i>Anas platyrhynchos</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >>



Group	Species	Scientific name	Designation
Bird	Merlin	<i>Falco columbarius</i>	Annex III, Section I Bird Species Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Mew Gull	<i>Larus canus</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Mute Swan	<i>Cygnus olor</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Northern Lapwing	<i>Vanellus vanellus</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Bird	Rock Pigeon	<i>Columba livia</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species
Bird	Sand Martin	<i>Riparia riparia</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Sky Lark	<i>Alauda arvensis</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Spotted Flycatcher	<i>Muscicapa striata</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Stock Pigeon	<i>Columba oenas</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Whinchat	<i>Saxicola rubetra</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List



Group	Species	Scientific name	Designation
Bird	Whooper Swan	<i>Cygnus cygnus</i>	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Yellowhammer	<i>Emberiza citrinella</i>	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Crustacean	Freshwater White-clawed Crayfish	<i>Austropotambius pallipes</i>	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
Insect - Butterfly	Marsh Fritillary	<i>Euphydryas aurinia</i>	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Threatened Species: Vulnerable
Insect - Butterfly	Small Heath	<i>Coenonympha pamphilus</i>	Threatened Species: Near threatened
Insect - Butterfly	Wall	<i>Lasiommata megera</i>	Threatened Species: Endangered
Insect Hymenopteran		<i>Andrena (Melandrena) nigroaenea</i>	Threatened Species: Vulnerable
Insect Hymenopteran	Gooden's Nomad Bee	<i>Nomada goodeniana</i>	Threatened Species: Endangered
Insect Hymenopteran		<i>Halictus (Seladonia) tumulorum</i>	Threatened Species: Near threatened
Insect Hymenopteran	Large Red Tailed Bumble Bee	<i>Bombus (Melanobombus) lapidarius</i>	Threatened Species: Near threatened
Insect – Mayfly (Ephemeroptera)		<i>Procloeon bifidum</i>	Threatened Species: Vulnerable
Mollusc	Blind Snail	<i>Cecilioides (Cecilioides) acicula</i>	Threatened Species: Vulnerable
Mollusc	Common Whorl Snail	<i>Vertigo (Vertigo) pygmaea</i>	Threatened Species: Near threatened
Mollusc		<i>Vertigo (Vertigo) moulinsiana</i>	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: Wildlife Acts Threatened Species: Endangered
Mollusc	Desmoulin's Whorl Snail	<i>Radix auricularia</i>	Threatened Species: Vulnerable
Mollusc	Ear Pond Snail	<i>Leiostryla (Leiostryla) anglica</i>	Threatened Species: Vulnerable
Mollusc	English Chrysalis Snail	<i>Deroceras (Deroceras) agreste</i>	Threatened Species: Data deficient
Mollusc	Globular Pea Mussel	<i>Pisidium hibernicum</i>	Threatened Species: Near threatened
Mollusc	Glutinous Snail	<i>Myxas glutinosa</i>	Threatened Species: Endangered
Mollusc	Heath Snail	<i>Helicella itala</i>	Threatened Species: Vulnerable
Mollusc	Lake Orb Mussel	<i>Musculium lacustre</i>	Threatened Species: Vulnerable
Mollusc	Marsh Whorl Snail	<i>Vertigo (Vertigo) antivertigo</i>	Threatened Species: Vulnerable
Mollusc	Moss Bladder Snail	<i>Aplexa hypnorum</i>	Threatened Species: Vulnerable
Mollusc	Moss Chrysalis Snail	<i>Pupilla (Pupilla) muscorum</i>	Threatened Species: Endangered



Group	Species	Scientific name	Designation
Mollusc	Smooth Grass Snail	<i>Vallonia pulchella</i>	Threatened Species: Vulnerable
Mollusc	Swan Mussel	<i>Anodonta (Anodonta) cygnea</i>	Threatened Species: Vulnerable
Mollusc	Tree Snail	<i>Balea (Balea) perversa</i>	Threatened Species: Vulnerable
Moss	Blunt-fruited Pottia	<i>Tortula modica</i>	Threatened Species: Vulnerable
Moss	Large White-moss	<i>Leucobryum glaucum</i>	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV
Moss	Sausage Beard-moss	<i>Didymodon tomaculosus</i>	Threatened Species: Vulnerable
Reptile	Common Lizard	<i>Zootoca vivipara</i>	Protected Species: Wildlife Acts
Terrestrial Mammal	Brown Long-eared Bat	<i>Plecotus auritus</i>	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Terrestrial Mammal	Daubenton's Bat	<i>Myotis daubentonii</i>	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Terrestrial Mammal	Eurasian Badger	<i>Meles meles</i>	Protected Species: Wildlife Acts
Terrestrial Mammal	Eurasian Pygmy Shrew	<i>Sorex minutus</i>	Protected Species: Wildlife Acts
Terrestrial Mammal	Eurasian Red Squirrel	<i>Sciurus vulgaris</i>	Protected Species: Wildlife Acts
Terrestrial Mammal	European Otter	<i>Lutra lutra</i>	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Terrestrial Mammal	Lesser Noctule	<i>Nyctalus leisleri</i>	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Terrestrial Mammal	Natterer's Bat	<i>Myotis nattereri</i>	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Terrestrial Mammal	Pine Marten	<i>Martes martes</i>	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
Terrestrial Mammal	Pipistrelle	<i>Pipistrellus pipistrellus sensu lato</i>	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Terrestrial Mammal	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Terrestrial Mammal	West European Hedgehog	<i>Erinaceus europaeus</i>	Protected Species: Wildlife Acts



APPENDIX C ARCHITECTURAL HERITAGE IMPACT REPORT

Monasterevin Bridge

Monasterevin, Co. Kildare

Bridge Remediation Works
Architectural Heritage Impact Assessment

December 2020



Contents :

1. Introduction	p 03
2. Heritage Protection Statutory Context	p 04
3. Site In Context	p 07
4. Special Heritage Interest Appraisal	p 14
5. Description of Works	p 17
6. Architectural Heritage Impact Assessment	p 24

1.0

Introduction

Shaffrey Architects have prepared the following Architectural Heritage Impact Assessment as part of an application to An Bord Pleanála pursuant to Section 177 (appropriate assessment of local authority development) of the Planning and Development Act, 2000, as amended.

The development consists of remediation works to Monasterevin Bridge a protected structure that will include additional embankment protection. Remediation works arise from damage to the bridge caused by scouring. Monasterevin bridge is an early nineteenth century bridge structure that is on the primary entrance road on the western side of the town.



Fig 1. Location Map



Fig 2. Monasterevin Bridge is located in the River Barrow SAC



Fig 3. Bridge located within Zoning F Open Space and Amenity To protect and provide for recreation, open space and amenity

2.0

Heritage Protection Policy & Context:

General:

All development is assessed on consistency with statutory policies, designations and guidelines for heritage protection. Ireland has ratified several European and International conventions in relation to the protection of its built heritage. This large body of conservation charters and associated conventions, declarations, documents etc. are essential framework for good practice in the protection and enhancement of the historic environment

The legal framework upon which the protection of Architectural Heritage is based stems from UNESCO's "Convention Concerning the Protection of the World Cultural and Natural Heritage" ratified by Ireland in 1991 and the "Granada Convention" ratified by Ireland in 1997.

The Granada convention in particular formed the basis for our national commitment to the protection of our architectural heritage. The legislative provisions for protection are contained in Part IV of the Planning and Development Act 2000.

The principal means by which the historic urban environment is protected, is set out in the Planning and Development Acts 2000 (as amended) and comprises principally the

1. Record of Protected Structures (Section 51)
2. Architectural Conservation Areas (Section 81)

The Planning and Development Act 2000 (as amended) requires each planning authority to compile and maintain a Record of Protected Structures (RPS). The Record of Protected Structures (RPS) is a mechanism for the statutory protection of the architectural heritage.

A protected structure is a building/structure that a local authority includes in its Record of Protected Structures because of its special interest from an architectural, historical, archaeological, artistic, cultural, scientific, social or technical point of view. The Record of Protected Structures, is part of the Development Plan for the Local Authority's functional area.

Each owner and occupier of a protected structure is legally obliged to ensure that a protected structure is maintained and protected from endangerment.

Protected Structure and its Curtilage:

The planning legislation gives protection to building/structure included in the 'Record of Protected Structures', and the wording of the legislation extends the protection to include its 'Curtilage', which is the area of ground that is directly connected with the functioning or inhabitation of the structure.

The extent of protection is determined by the extent of the curtilage which may or may not have been defined by the Planning Authority. The only circumstance where the protection can extend beyond the curtilage is where the "attendant grounds" provision is used by the planning authority at the time of inclusion of a structure in the Record of Protected Structures.

The attendant grounds of a structure are lands outside the curtilage of the structure but which are associated with the structure and are intrinsic to its function, setting and/or appreciation. In many cases, the attendant grounds will incorporate a designed landscape deliberately laid out to complement the design of the building or to assist in its function.

The notion of curtilage is not defined by legislation, but the Architectural Heritage Protection Guidelines for Planning Authorities guidelines states that for the purpose of the guidelines. *'it can be taken to be the parcel of land immediately associated with that structure and which is (or was) in use for the purposes of the structure'.*

'It should be noted that the meaning of 'curtilage' is influenced by other legal considerations besides protection of the architectural heritage and may be revised in accordance with emerging case law.'

The following three considerations are used to determine the extent of curtilage:

(Reference Architectural heritage guidelines)

1. A functional connection between the structures;
2. An historical relationship between the main structure and the structure;
3. The ownership past and present of the structures.

Statutory Heritage protection under Planning and Development Act 2000 Part IV Architectural Heritage:

The Planning and Development Act provides for the following mechanism to protect architectural heritage.

Section 51—Record of protected Structure

1) For the purpose of protecting structures, or parts of structures, which form part of the architectural heritage and which are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest, every development plan shall include a record of protected structures, and shall include in that record every structure which is, in the opinion of the planning authority, of such interest within its functional area.

Section 81.— Architectural Conservation Area

(1) A development plan shall include an objective to preserve the character of a place, area, group of structures or townscape, taking account of building lines and heights, that—

- (a) is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or value, or
 - (b) contributes to the appreciation of protected structures,
- if the planning authority is of the opinion that its inclusion is necessary for the preservation of the character of the place, area, group of structures or townscape concerned and any such place, area, group of structures or townscape shall be known as and is in this Act referred to as an “architectural conservation area”.

The Planning and Development Act provides for the following mechanism to provide guidelines on protection of the architectural heritage.

Section 52 (1) of the Planning and Development Act 2000 obliges the Minister to issue guidelines to planning authorities concerning development objectives (i.e. protecting structures), and Section 28 of the Act requires planning authorities (including An Bord Pleanála) to have regard to them in the performance of their functions

National Guidelines

Architectural Heritage Protection for Planning Authorities

These Guidelines were issued by the Department of the Environment, Heritage and Local Government in 2004. The Guidelines seek to guide planning authorities concerning development objectives for protecting structures, or parts of structures, which are of special architectural, artistic, cultural, scientific, social or technical interest.

Part 2 of the Guidelines provide detailed guidance to support planning authorities in their role to protect the architectural heritage when a protected structure is the subject of a development proposal.

Statutory Heritage Protection Under Kildare County Council Development Plan 2017-2023 & Monasterevin Local Area Plan 2016-2022:

The application site lies within the administrative functional area of Kildare County Council where development is guided by the provisions of the Kildare Council Development Plan 2017-2023. The Kildare County Development Plan 2017-2023 sets out the statutory framework for land use planning and sustainable development in County Kildare.

Detailed policies for the protection of archaeological and architectural heritage area are set out in Chapter 12 Architectural and Archaeological Heritage of the Kildare County Development Plan 2017-2023.

The Monasterevin Local Area Plan 2016-2022 sets out in greater detail the Council's requirements for new development within the overall framework of the County Development Plan including the core strategy and other overarching policies and development management objectives and standards.

Kildare County Development Plan 2017-2023

Heritage Protection Policies & Objectives contained within the Kildare County Development Plan 2017-2023 of relevance include the following .

Policies : Protected Structures

PS 1 Conserve and protect buildings, structures and sites contained on the Record of Protected Structures of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

PS 2: ‘Protect the curtilage of protected structures or proposed protected structures and to refuse planning permission for inappropriate development within the curtilage or attendant grounds of a protected structure which would adversely impact on the special character of the protected structure including cause loss of or damage to the special character of the protected structure and loss of or damage to, any structures of architectural heritage value within the curtilage of the protected structure. Any proposed development within the curtilage and/or attendant grounds must demonstrate that it is part of an overall strategy for the future conservation of the entire built heritage complex and contributes positively to that aim.

PS 7: Promote best practice and the use of skilled specialist practitioners in the conservation of, and any works to, protected structures. Method statements should make reference to the DAHG Advice Series on how best to repair and maintain historic buildings. As outlined in the Architectural Heritage Protection Guidelines, DAHG, a method statement is a useful tool to explain the rationale for the phasing of works. The statement summarises the principal

impacts on the character and special interest of the structure or site and describe how it is proposed to minimise these impacts. It may also describe how the works have been designed or specified to have regard to the character of the architectural heritage.

PS 11: Promote the maintenance and appropriate re-use of buildings of architectural, cultural, historic and aesthetic merit which make a positive contribution to the character, appearance and quality of the streetscape or landscape and the sustainable development of the county. Any necessary works should be carried out in accordance with best conservation practice.

PS 12: states:
 'Protect the protection of original or early building fabric including timber sash windows, stonework, brickwork, joinery render and slate. Likewise the Council will encourage the re-instatement of historically correct traditional features.'

PS 16: Protect and retain important elements of the built heritage including historic gardens, stone walls, landscapes and demesnes, and curtilage features.

PS 19: Have regard where appropriate to DAHG Guidelines and conservation best practice in assessing the significance and conservation of a Protected Structure, its curtilage, demesne and setting.

PS 20: states:
 'Have regard where appropriate to DAHG Guidelines and conservation best practice in assessing the impact of development on a Protected Structure, its curtilage, demesne and setting.'

Policies: Architectural Conservation Areas

ACA 2 Ensure that any development, modifications, alterations, or extensions within an ACA are sited and designed appropriately, and are not detrimental to the character of the structure or to its setting or the general character of the ACA and are in keeping with any Architectural Conservation Area Statement of Character Guidance Documents prepared for the relevant ACA

ACA 3 Have regard to DAHG Guidelines and conservation best practice in assessing the significance of a historic town or urban area and the formulation of an ACA or in assessing development proposals relating to an ACA.

Monasterevin Local Area Plan 2016-2022

Protecting and enhancing Monasterevin's significant and unique built heritage is one of the core objectives of the Local Area Plan.

Heritage Protection Policies & Objectives contained within the Local Area Plan of relevance include the following

Monasterevin LAP Architectural Heritage – Policies

It is the policy of the Council:

BH 1: To protect the historic core of the town in particular on West End, Main Street and Drogheda Street and to resist the demolition of vernacular architecture of historical, cultural and aesthetic merit, which make a positive contribution to the character, appearance and quality of the local streetscape and the sustainable development of Monasterevin.

BH 3: To protect and preserve buildings and the spaces between structures that create a distinctive character in the proposed ACA. Improvements to historic buildings and the public realm will consolidate and protect this asset.

BH 4: To protect and preserve those built heritage items listed in Table 14 and shown on Maps 4(A) and 4(B) of this Local Area Plan

Monasterevin LAP Architectural Heritage – Objectives

It is an objective of the Council:

BHO1: To ensure that any development which may take place within the confines of Moore Abbey Demesne is carried out in a planned coherent way while sympathetic to the demesne, its boundaries and the overall historic landscape.



Fig 4. Bridge is located on the periphery of Monasterevin Architectural Conservation Area

3.0

Context

Historic Urban Context:

The following provides a historical overview

The town of Monasterevin is situated on the eastern bank of the River Barrow. Monasterevin derives its name from Mainister-Emhim from the monastery founded by St. Evin's in the sixth century. The original monastery likely fell during the Viking raids in the ninth and tenth centuries.

The Cistercian Abbey of Rosglass was founded at the site under the patronage of Dermot O'Dempsey chief of Clanmalier and Lord Of Offlay in the 12th century. With the Dissolution of the Monasteries in the sixteenth the Abbey and its possessions were granted to George Lord Audley, who assigned it to Adam Loftus, Viscount Ely.

The Abbey and its possessions passed to the Drogheda family by the marriage of Jane Loftus daughter of the Arthur Loftus third Viscount Loftus of Ely to Charles Lord Moore son of Henry Hamilton Moore 3rd Earl of Drogheda. There eldest son Henry became fourth Earl of Drogheda in 1714. Henry, inherited the estate of Monasterevin (later called Moore Abbey) from his grandfather, Lord Loftus in 1725.

He was succeeded by his brother Edward, who had to sell much of the Moore estates in County Louth to meet Henry's debts. The family made their seat at Monasterevin, where they later built Moore Abbey. Edward's son Charles Moore the sixth earl was created 1st Marquess of Drogheda in 1791.

In 1767 the sixth earl pulled down the old abbey and used the stones to build a new parish church,. He replaced the abbey with a neo-gothic style mansion known as Moore Abbey. The family were responsible for laying out the town of Monasterevin in a typical 18th Century grid format undergoing extensive planning and development between 1790 to 1860. The town had previously consisted of a single long street called Main street.

The construction of the Grand Canal in 1786 and later the arrival of railway in 1847 led to industrial development in the town, most notably Cassidy's Distillery and Brewery in the Dublin Road. Established by John Cassidy in 1784 and further developed by his son Robert, the distillery was of prime economic importance to the town. The business continued until the firm closed down in 1921.

The 19th century improvements to the town infrastructure included the building of a new Town Bridge in 1832 by the Earl of Drogheda. Samuel Lewis refers to the construction of the bridge in his Topographical Dictionary of Ireland of 1837. The bridge occupied a

location on the edge of Moore Abbey Demesne providing a straightened alignment with Dublin road heading north out of the town.. Monasterevin has an unusual number of Bridges giving rise to the appellation the Venice of Ireland.

The following extract from Samuel Lewis' Topographical Dictionary of Ireland of 1837

"The street is intersected by the Dublin road ; and a bridge of six arches over the Barrow was erected in 1832, in a direct line with the road, by which the former sharp and dangerous turn is avoided. A new street has recently been laid out in a direction parallel with the back of the principal street, at the private expense of the Rev. Henry Moore ; and great improvements have been made on the line of the Grand Canal by that company, among which may be noticed the construction of an elegant cast iron drawbridge over the canal, in 1829, and the carrying of the canal over the Barrow by an aqueduct of three arches of 40 feet span, handsomely built of hewn limestone, and surmounted by an iron balustrade ; a branch canal from this place has also been extended to the thriving town of Portarlinton. The extensive brewery, distillery, and malting concern of Mr. Cassidy, whose dwelling-house is highly ornamental to the town, afford employment to many of the working class ; and a small tobacco and a tobacco-pipe manufactory are also carried on. The traffic arising from its situation as a great thoroughfare on one of the branches of the great southern road from the metropolis adds to the support of the town. Its situation in the midst of a vast extent of turbary affords eminent advantages for the establishment of manufactures ; and its facilities of communication with Dublin, Shannon harbour, and Waterford, by means of the Grand Canal and the Barrow navigation, render it peculiarly favourable to the carrying on of a very extensive inland trade."

The 10th Earl of Drogheda abandoned the Moore Abbey after the First World War and it was leased to John Count McCormack, the tenor, from 1925 to 1937. The 10th Earl then put the abbey up for sale shortly after Count McCormack moved out and in 1938 it became the Irish headquarters of the Sisters of Charity of Jesus and Mary, where they now have a training school.

The closure of the distillery in the 1920's and later of the railway resulted in the slow decline of the town throughout most of the 20th Century. During the Emergency of 1939-45 Monasterevin prepared to defend itself against any aggressor by raising its own Local Defense Force, preparing its famous bridges for demolition, and building a pillbox to defend the town which still survives on the eastern wing wall of the bridge. The bridge structure remains relatively unchanged from when it was first constructed.



Fig 5. 1752 County Kildare Noble & Keenan - bridge crossing indicated further north of the Monasterevin bridge - this is most likely Pass bridge



Fig 6. Taylor & Skinner: Maps of the Roads of Ireland Surveyed 1777, Pass bridge located on the Portarlinton Road. A second bridge is indicated opposite the church



Fig 7. Date 1783 map; centre-west segment. On northeast sheet, "By Lieut: Alexr: Taylor, of His Majesty's 81st: Regt:" and "Downes Sculpt." Contributor Taylor, Alexander, -1828, Downes, Charles John Date 1783. The earlier bridge alignment runs by the Charter school house



Fig 8. A survey of the town of Monasterevin done with a view to shew the advantage & improvement of by Longfield, John, ca. 1775-1833 surveyor. Published 1807 NLI digital database. The maps shows the proposed location for the new bridge replacing the earlier bridge crossing further north opposite the St John Church which had been built in 1771 by the sixth Earl of Drogheda In 1785, the Barrow Line of the Grand Canal reached Monasterevin. It would be 1829 before the Aqueduct was constructed over the Barrow replacing the lock gate crossing.



Fig 9. A plan of Monasterevin County Kildare. Names of tenants & area of holdings shown. Longfield, John, ca. 1770 NLI digital database.-1840. The new bridge shown constructed - with earlier bridge having been removed

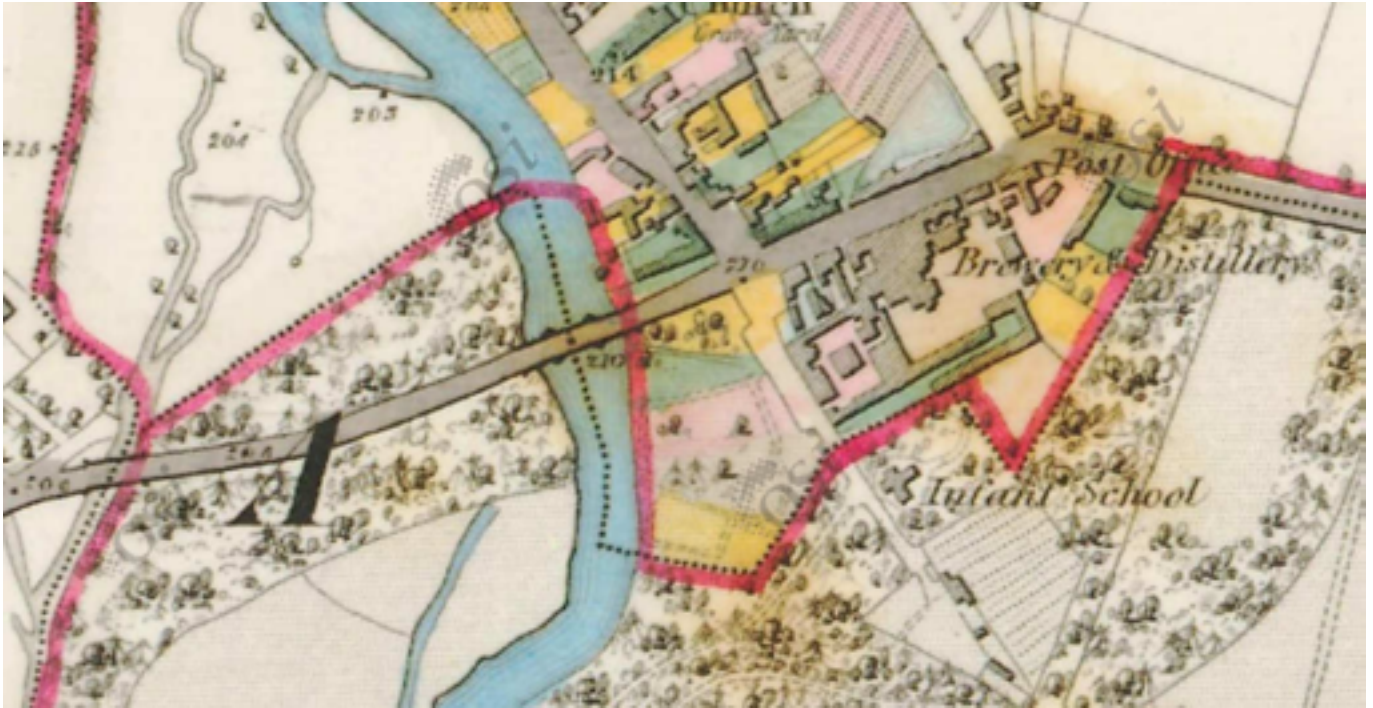


Fig 10. First Edition Ordnance Survey Map 1837 - new town bridge constructed

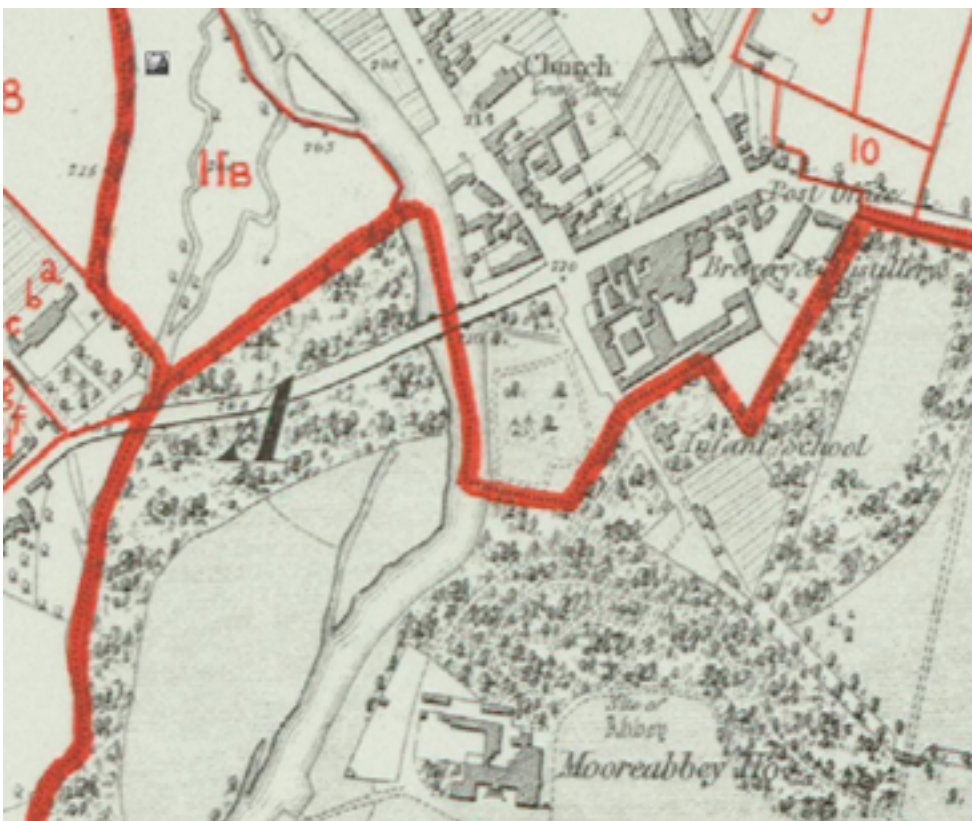


Fig 11. Griffith Valuation Map 1852. The red line corresponds to the north boundary of Moore Abbey House Demesne. The woodland within the Demesne provided a sylvan characteristic to the entrance to the town



Fig 12. Town Plan 1881 Griffith Valuation

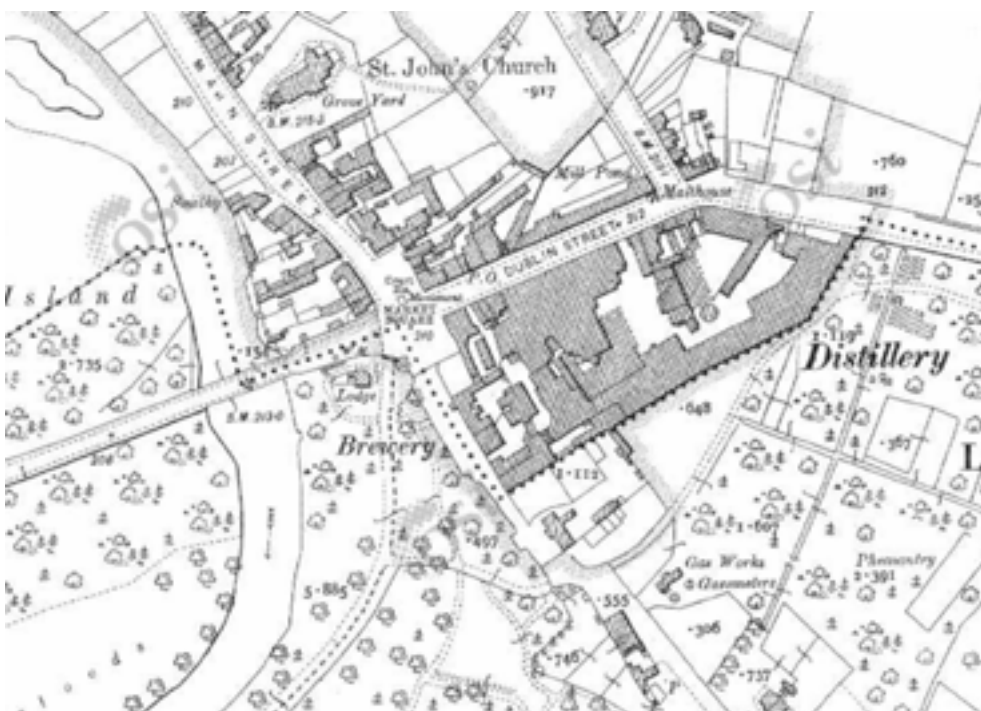


Fig 13. Second Edition Ordnance Survey Map 1908



Fig 14. Southern side of bridge - downstream



Fig 15. View from west embankment towards the town



Fig 16. View up stream - natural riparian edge



Fig 17. North side of bridge upstream - damage contributed to scouring at cutwaters



Fig 18. View eastward towards the town



Fig 19. View westward from within the Architectural Conservation Area



Fig 20. Concrete Pillbox integrated into the bridge parapet during the Emergency of 1939-45



Fig 21. View of the Aqueduct bridge during the arterial drainage scheme (1926 – 1934)

4.0

Special Heritage Interest Appraisal

Description Overview:

Kildare County Council Record of Protected Structures:
Reference: B26-38

Entry Description:

Name: Monasterevin Bridge, Monasterevin, Co. Kildare
Townland: Mooreabbey Demesne
Description: Bridge

National Inventory of Ireland Reference
11816057

Stone masonry bridge over the river barrow built c.1832*, consisting of five-arch elliptical cut-stone barrel vaults the with semi-circular buttressing pier build on circular cutwaters. Pier are of fine cut ashlar blocks with arch's formed of cut-stone voussoirs. Parapet wall consists of coursed stone with cut-stone coping. The underside of the arches are gunited.



Fig 22. Impressive 5-span elliptical arched bridge spanning the River Barrow

* Cartographic evidence would seem to corroborate a date of 1832 for the bridge construction as notes by Lewis in his Topographical Dictionary differing from the earlier date given in the NIAH inventory.

Appraisal:

Faro Convention Council of Europe's Framework Convention on the Value of Cultural Heritage for Society: Heritage definition: is a group of resources inherited from the past which people identify, independently of ownership, as a reflection and expression of their constantly evolving values, beliefs, knowledge and traditions. It includes all aspects of the environment resulting from the interaction between people and places through time.

The Planning and Development Act 2000 (as amended) defines the architectural heritage to be structures or parts of structures which are of Architectural Interest, Historical Interest, Archaeological Interest, Artistic Interest, Cultural Interest, Scientific Interest, Social Interest, Technical Interest. The categories of special interest can be taken as the criteria to be considered when evaluating the heritage value of a structure. The categories are not mutually exclusive and a structure may be attributed with several of the categories. The categories of Special Interest are rated regarding is significance. The National Inventory of Architectural Heritage (NIAH) assigns rating values as follows International, National, Regional, Local and Record Only. Structures evaluated using the national inventory of architectural heritage criteria which are attributed with a rating value of international, national or regional importance generally warrant protected structure status.

National:

Structures or sites that make a significant contribution to the architectural heritage of Ireland. These are structures and sites that are of great architectural heritage significance in an Irish context.

Regional:

Structures or sites that make a significant contribution to the architectural heritage within their region or area. They also stand in comparison with similar structures or sites in other regions or areas within Ireland. Increasingly, structures that need to be protected include structures or sites that make a significant contribution to the architectural heritage within their own locality.

Local:

These are structures or sites of some vintage that contribute to the architectural heritage but may not merit being placed in the RPS separately. Such structures may have lost much of their original fabric.

The purpose of protection is also to the control and manage future changes to a structure. This should be borne in mind when assign-

ing those special interest categories which may not relate directly to the physical fabric, such as historical, social and cultural interests.

Architectural Heritage Interest Value

Architectural value is directly related to aesthetic value, the visual qualities, design and evolution of a building, object, or site and the sensory experience it offers but also in the integrity of all its components as a unique product of the specific building technology of its time.

Protected structure definition:

A 'protected structure' is defined as any structure or parts of structures, which form part of the architectural heritage and which are of special Architectural, Historical, Archaeological, Artistic, Cultural, Scientific, Social or Technical interest.

A structure is defined by the Act as 'any building, structure, excavation, or other thing constructed or made on, in or under any land, or any part of a structure'. In relation to a protected structure or proposed protected structure, the meaning of the term 'structure' is expanded to include:

- the interior of the structure;
- the land lying within the curtilage of the structure;
- any other structures lying within that curtilage and their interiors, and
- all fixtures and features which form part of the interior or exterior of the above structures.

Appraisal National Architectural Inventory Ireland

NIAH Reg No: 11816057

Rating: Regional

Categories of Special Interest

- Architectural
- Historical
- Social
- Technical

Description

Five-arch cut-stone road bridge over river, c.1780, with semi-circular cut-waters/piers, cut-stone voussoirs and cut-stone coping to parapet walls. Coursed cut-stone walls. Cut-stone semi-circular cut-waters/piers to north-west and to south-east with stringcourses and half-domed capping. Cut-stone coping to parapet walls. Five elliptical arches. Cut-stone voussoirs. Rubble stone soffits with render over. Sited spanning River Barrow with grass banks to river.

Appraisal

Monasterevin Bridge is a fine stone bridge that forms an imposing feature on the River Barrow and is one of a group of bridges on the section of that river that passes through County Kildare.

The construction of the arches that have retained their original shape is of technical and engineering merit. The bridge exhibits good quality stone masonry and fine, crisp joints. The bridge is of considerable historical and social significance as a reminder of the road network development in Ireland in the late eighteenth century.

Architectural Heritage Interest value

Architectural value is directly related to aesthetic value, the visual qualities, design and evolution of a building, object, or site and the sensory experience it offers but also in the integrity of all its components as a unique product of the specific building technology of its time.

The following is identified as contributing to the architectural heritage interest value.

- Good quality architectural design
- Exemplar of period building typology
- Area character contribution

A review of the NIAH appraisal would concur with the assessment that the bridge is of architectural heritage interest value.

Historical Heritage Interest Value

Value derived from the ways in which people draw sensory and intellectual stimulation from a place. The capacity of a place to convey, embody, or stimulate a relation or reaction to the past. Historical value can accrue in several ways: from the heritage material's age, from its association with people or events, from its rarity and/or uniqueness, from its technological qualities, or from its archival/documentary potential.

The following is identified as contributing to the historical heritage interest value

- Visual physical record associative with civil history and heritage of Ireland.
- Associations with the Moore Family

A review of the NIAH appraisal would concur with the assessment that the bridge is of historical heritage interest value.

Archaeological Heritage Interest Value

Special archaeological interest is essentially defined by the degree to which material remains can contribute to our understanding of any period or set of social conditions in the past (usually, but not always, the study of past societies). The characteristic of archaeological interest in the context of the RPS must be related to a structure.

Structures of special archaeological interest may also be protect-

ed under the National Monuments Acts. Structures can have the characteristics of both archaeological and architectural interest as these are not mutually exclusive. A complex of industrial buildings may have archaeological interest because of its potential to reveal artefact's and information about the evolution of industry that may be useful to archaeologists, historians and the public. lessens

No features identified as contributing to the Archaeological heritage interest value. Structure does not meet criteria for Archaeological heritage interest value.

Artistic Heritage Interest Value

Objects showing imaginative skill in arrangement or execution considered to be aesthetically satisfying that is creative or that requires a special art or craft skill.

No features identified as contributing to the Artistic heritage interest value. Structure does not meet criteria for artistic heritage interest value.

Cultural Heritage Interest Value

The characteristic of cultural interest permeates the architectural heritage and can, in the broadest terms, include aesthetic, historic, scientific, economic or social values of past and present generations.

Special cultural interest apply to:

1. Those structures to which the Granada Convention refers as 'more modest works of the past that have acquired cultural significance with the passing of time';
2. Structures that have literary or cinematic associations, particularly those that have a strong recognition value;
3. Other structures that illustrate the development of society, such as early schoolhouses, library buildings, swimming baths or print-works. If these associations are not related to specific aspects of the physical fabric of a structure, consideration could be given to noting them by a tourism plaque or other such device

Nothing identified as contributing to the Cultural heritage interest Value. Structure does not meet criteria for cultural heritage interest value.

Scientific Heritage Interest Value

The scientific interest, or research value, of a structure will depend on the importance of the data involved and on its rarity and/or quality. Its scientific interest should also be assessed as to how well it represents the area of research in question and the degree to which the structure may contribute further objective information.

For example:

1. The results of scientific research may be seen in the execution of the structure;
2. The materials used in the structure may have the potential to contribute to scientific research,
3. The structure may be associated with scientific research that has left its mark on the place, such as early Ordnance Survey benchmarks carved into stonework.

No features identified as contributing to the scientific heritage interest value. Structure does not meet criteria for scientific heritage interest value.

Social Heritage Interest Value

Social value encompasses the significance of the historic environment to contemporary communities, including people's sense of identity, belonging and place, as well as forms of memory and spiritual association.

The following is identified as contributing to the social heritage interest value

A safe crossing point was essential to providing a passage over a river to provide transport networks between centres of economic activity. Towns naturally emerged at crossing points as rivers played a significant role in sustaining a town itself, providing a reliable source of food and other resources that could sustain economic activity. The river allowed for water transportation and such means of transport were crucial in sustaining economic prosperity. Monasterevin has an unusual number of bridges giving rise to the appellation of the Venice of Ireland.

A review of the NIAH appraisal would concur with the assessment that the bridge is of social heritage interest value.

Technical Heritage Interest Value:

Technical interest in a structure relates engineering solutions construction which are important examples of virtuoso, innovative or unusual engineering design or use of materials.

The following is identified as contributing to the social heritage interest value

Exemplar of engineering masonry design practice of its time and construction evolution. A semi-elliptical arch has a significant advantage over round-headed ones, by giving much better headroom over the full width of the bridge. . They were more complicated to build, creating greater thrust against abutments. Not all arches have the shape of a true ellipse. In order to make setting out easier, three-centred arches have small-radius circular arcs at the corners and a larger-radius circular arc across the centre.

A review of the NIAH appraisal would concur with the assessment that the bridge is of technical heritage interest value

Conclusion:

The Monasterevin Bridge is a fine stone bridge that forms an impressive feature on the River Barrow part of a collective of bridge s that span this section of the river Barrow at Monasterevin, historically a pivotal location on the transport network that connected part of the wider country to Dublin. The bridge exhibits good engineering skill and quality of stone masonry in construction , skilfully executed in a visually pleasing architectural style. The bridge is of architectural and technical heritage interest value.

The bridge's historical and social significance is a reminder of the road network development in Ireland a fine example of civil engineering prowess and feat of the time, an important reminder of Ireland's civil engineering history and heritage.

5.0

Description of Works



Fig 23. Scouring on the upstream side of the bridge has damaged the cutwaters and undermining pier dislodging masonry

In October 2014, Malachy Walsh and Partners Consulting Engineers conducted a Principle Inspection survey for Monasterevin Bridge. The bridge was given an overall structural rating of “Category 4” given in accordance with EIRSPAN Bridge Management System Principal Inspection manual (AM-STR-06054) published by TII. The areas of particular deterioration include the Bridge piers and Riverbed scour, both categories receiving a “Category 4” rating. Rating scale is 1 to 5 with rating 5 identifying potential for collapse.

Scour of foundations is one of the most common causes of damage and failure in masonry arch bridges in waterways. Scour is the erosion of the stream bed around and from under the foundations of a bridge. Results of scoring can cause severe settlements and/or movements in the bridge. Water flow is normally parallel to the river bed and an obstruction such as a bridge pier, changes the

direction of flow around the pier. This flow produces a horseshoe vortex which extends around the sides of the pier causing scouring. Streamlining of the pier called cutwaters at the upstream and downstream ends have a beneficial effect in creating less turbulent .

The original masonry cutwaters had been encased in concrete as part of previous improvement work. The River Barrow has been the subject of an arterial drainage scheme (1926 – 1934) with 210 km of main rivers and tributaries and 175 km of smaller drains deepened and widened, to improve conveyance and the concrete cutwaters could date from then but further research is required to verify this.

O’Connor Sutton Cronin (OCSC) were appointed by Kildare County Council to undertake condition survey of Monasterevin Bridge. Following the condition survey OCSC undertook the design of the remediation works required for the structure.

The survey identified that the proposed repair works consists of repointing of the parapets, relaying of the bridge surface, reconstruction of the riverbed under some of the arches, removal of vegetation from embankments and the inclusion of underpinning repairs to the upstream cutwaters

The proposed remediation works consists of:

1. Remedial repair works to piers and cutwater : Works will require removal of defective sections of the concrete cutwater , dismantling displaced masonry , grouting voids, reinstatement of displaced masonry and renewal of concrete cutwater
2. Localised vegetation removal and pointing of opening joint\ Dismantling will be carried out to remove embedded roots
3. Rock armour protection to the east embankment of the river

The approach to conservation both in material and aesthetic terms for masonry structures generally should adopt traditional historic materials and construction techniques where appropriate . Most historic masonry bridges were built with hydraulic based lime mortars and the use of these material is recommended. Modern techniques of repair can be utilised and in many instances can be the only feasible solution. Careful consideration will be required in the design of lime pointing mortar for the different conditions present in the wet, damp or wet/dry cycle zone of construction within the bridge structure. Similarly grouting of masonry cores require a material appropriate to location and the inherent nature and composition of the masonry structure.

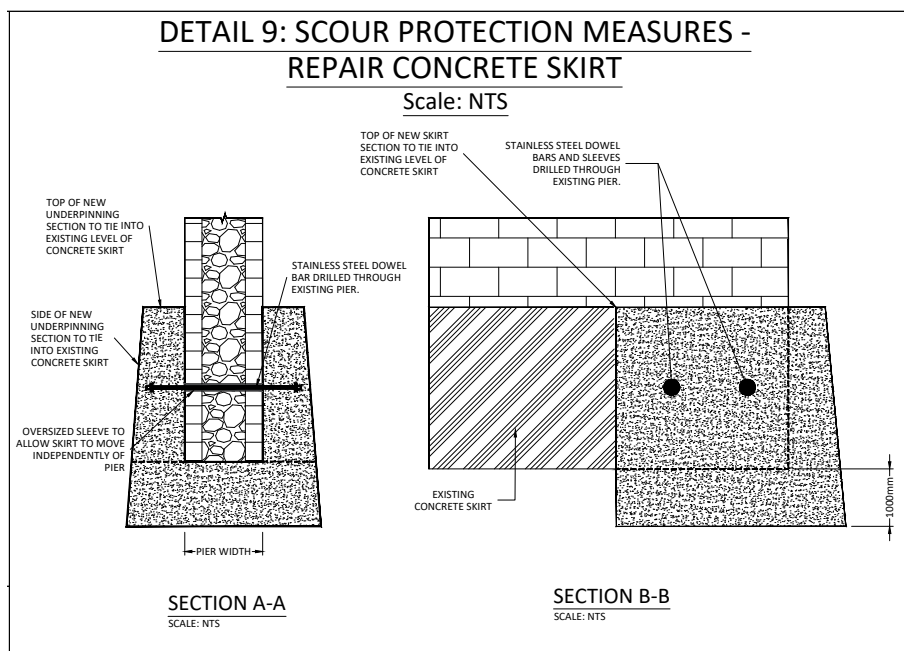


Fig 24. Repair requires replacement of damaged section of concrete cutwater and repair/reconstruction of displaced masonry.



Fig 25. Displaced masonry with open joints



Fig 26. Localised rebuilding required to remove embedded roots



Fig 27. View west over bridge - upper section of bridge structure is in relatively good condition



Fig 28. Localised vegetation removal and pointing of open joints to parapet wall



Fig 29. Repair to damage masonry required to west bank wing wall



Fig 30. View to north upstream side of bridge , where settlement and displacement has occurred to pier structures



Fig 31. View to eastern embankment on downstream side of river. Scouring has been identified along river edge and rock armour protection is proposed along river



Fig 32. Outfall from original mill pond that served the distillery on the east embankment



Fig 33. Scouring erosion along east embankment. Rock armour protection proposed to edge



Fig 34. Masonry wall on east embankment will require rebuilding once trees are removed. Partial collapse has occurred. Wall may align with a structures built to infill water body indicated on the 1837 OS map in the later part of the nineteenth century

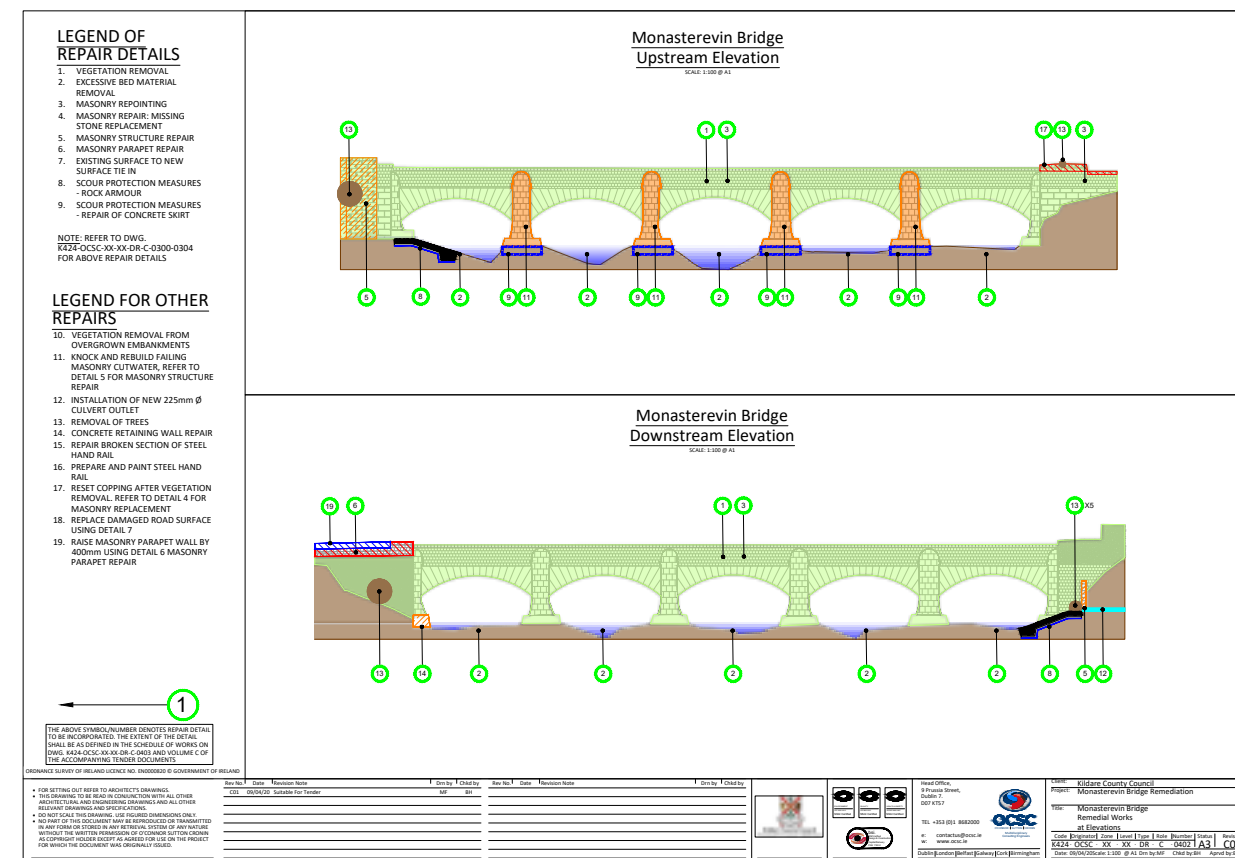
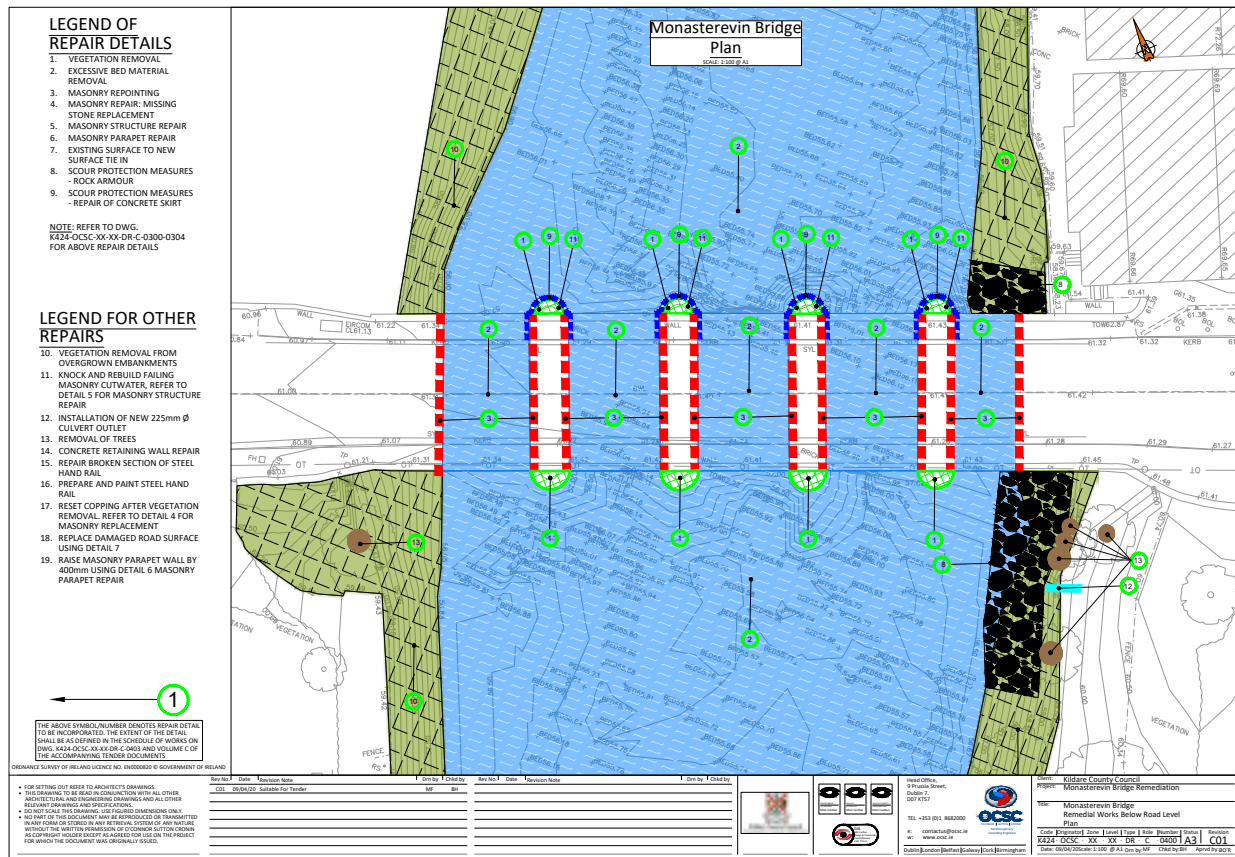


Fig 35. Scope of repair works proposed to Bridge Structure

6.0

Architectural Heritage Impact Assessment

Architectural Heritage Impact Considerations:

This section addresses the impact of the proposed works relating to the Protected Structure. The architectural heritage impact assessment assesses the impact having regard to compliance with statutory policies, designations and guidance as outline in Section 2 of this report, in particular regarding impacts on the historic urban area , character of the protected structure and its special heritage interest value.

The impact of the proposed development on the Historic Urban Context

Monasterevin Bridge over the River Barrow on R445 road is located on the periphery of the Monasterevin Conservation Area the primary arrival point to the town from the West side. The green riparian edge to the river provides a naturalistic backdrop to either side of the bridge.

Traditionally development was not built onto the river edge in the town , except for a recent apartment development on the east embankment of the north side of the bridge, the setting remains relatively unchanged. The proposed works will not alter the bridge structure or its contribution to the entrance character to the town.

The rock armour protection proposed for the eastern embankment will remove vegetation at the rivers edge. Repair and reconstruction of the existing masonry wall and maintaining the rock armour alignment at the level of the concrete cutwater to provide a planted area in front of wall will minimise it impact along the river edge.

The proposed works will not adversely impact on the historic urban context and the overall setting of the bridge on the River Barrow .

The impact of the proposed works to the Protected Structure

Works in this context include removal alteration , addition repair and renewal .These impacts can often represent the more significant impacts as these will result in physical intervention to the structure and fabric.

The proposed work are necessary to repair scour induced damage to the bridge structure. Work will restore the masonry structure and reinstate the concrete cutwater protection. The alterations proposed require localised invasive work but these have been designed to minimise impact both visual and physical using appropriate materials compatible with the historic masonry structure. The proposed works will not have an adverse impact on the heritage special interest value of the protected structure.



Fig 36. View eastward over bridge to town entry point



Fig 37. View to east bank to north side of bridge



Fig 38. View to east bank to south side of bridge , river edge forms boundary to Moore Abbey House Demesne



Fig 39. View east wards towards the bridge, with entrance to Moore Abbey House Demesne on the left.