SNC·LAVALIN

ATKINS
Member of the SNC-Lavalin Group

NW Term Maintenance Contract No.3

Year 1 Structures

Transport Infrastructure Ireland

15/11/2019

Notice

This document and its contents have been prepared and are intended solely as information for Transport Infrastructure Ireland and use in relation to Report

WS Atkins International Limited assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

Document history

Revision	Purpose description	Origin-ated	Checked	Reviewed	Author-ised	Date
Rev 1.0	Draft	NS & CR	NS	POD	MJ	25/06/2019
Rev 2.0	Report for Issue	NS & CR	NS	POD	MJ	23/08/2019
Rev 3.0	Finalised Report	NS & CR	NS	POD	MJ	01/11/2019
Rev 4.0	Finalised Report – minor amendments	NS & CR	NS	POD	MJ	15/11/2019

Client signoff

Client	Transport Infrastructure Ireland
Project	NW Term Maintenance Contract No.3
Job number	5162160
Client signature / date	

Contents

Chapter		Page
1.	**Introduction**	**1**
1.1.	Project Background and Context	1
2.	**Project Description**	**5**
2.1.	Proposed Works	5
2.2.	Bridge Descriptions	17
3.	**Scope of Study**	**33**
3.1.	Aims of the Report	33
3.2.	Legislative Context	33
3.3.	Appropriate Assessment Process	34
4.	**Methods 36**	
4.1.	Guidance documents	36
4.2.	Data Collation	36
4.3.	Statement of Authority	37
5.	**Appropriate Assessment**	**38**
5.1.	Connectivity of the Works Area to Natura 2000 Sites	38
5.2.	Description of the Special Areas of Conservation	42
5.3.	Description of the Special Protection Areas	55
5.4.	Conservation Objectives	61
5.5.	Qualifying Interests	62
5.6.	Likelihood of Potential Impacts on Natura 2000 sites	65
5.7.	Cumulative impacts	77
5.8.	Mitigation Measures	79
6.	**Conclusions**	**147**
References		**148**
Appendix A.	**Qualifying Interests of Natura 2000 sites**	**150**

Tables

Table 1-1	EIRSPAN bridge components and works.
Table 2-1	Summery details of bridges requiring Appropriate Assessment.
Table 2-2	Summary Table of Work Categories for each bridge.
Table 5-1	Bridge location relative to Natura 2000 Sites and Surface Water connectivity.
Table 5-2	SAC Qualifying Interests.
Table 5-3	SPA Qualifying Interests.
Table 5-4	Potential negative impacts of work items.
Table 5-5	Work items identified as having negative impacts to be considered further.
Table 5-6	Works categories, potential impacts and receptors.
Table 5-7	Potential Impacts to Natura 2000 sites at each bridge.
[redacted]	[redacted]
Table 5-9	Bridges within / upstream of an OPW works scheme.
Table 5-10	TII Road Schemes in the North West Region.

Figures

Figure 1-1 Year 1 NIS Structures (Galway, Mayo & Leitrim)
Figure 1-2 Year 1 NIS Structures (Donegal)
Figure 2-1 Appropriate Assessment Process (Source: DEHLG, 2009).

1. Introduction

The EIRSPAN Bridge Management System covers all aspects of bridge management including routine maintenance. Over the past number of years routine maintenance contracts have been undertaken by private contractors under Bridge Term Maintenance contracts. In the North West Region, the most recent contract concluded in December 2016. A Bridges Term Maintenance Contract for 693 bridges in the North West Region is being progressed by Transport Infrastructure Ireland (TII) under a new contract.

TII have appointed Atkins as the consultant to provide services including bridge inspections and reporting, ecological assessment, production of contract documents, tender assessment and contract administration and site supervision.

As part of this contract, Atkins Ireland was commissioned by TII to provide a report to support TII in making a screening decision as to whether Appropriate Assessment of proposed routine maintenance works to bridges in the north west of Ireland (i.e. Task Order 289) under the North West Bridges Term Maintenance Contract No.3 would be required. TII undertook the Screening for Appropriate Assessment and issued determinations for each structure.

TII determined that likely significant effects could not be ruled out for 28 bridges in the North West Region and thus require Appropriate Assessment. This report is a Natura Impact Statement and provides supporting information to TII in making their Appropriate Assessment decision on these 28 bridges.

1.1. Project Background and Context

The Bridge Term Maintenance Contract for the North West region includes 693 No. bridges, which are located on the national road network across the north west of Ireland in counties Donegal, Mayo, Galway, Sligo, Roscommon, Cavan, Leitrim and Monaghan.

Each of these bridges will require four routine inspections. It is intended to inspect each and every structure in 2017 Q4, 2019 Q1, 2020 Q1 and 2021 Q1. When data from the inspections is entered into the database Works Orders are generated and it is intended that annual routine maintenance work will be undertaken by an appointed Contractor between 1st March and 30th September in each of the years 2018, 2019, 2020 and 2021. It is these Works Orders that are subject to ecological assessment.

The maintenance operations (or Works Orders) to be carried out as part of the Project are generally minor, routine and non-structural works. The Works Orders are generated through the EIRSPAN database, which contains 14 bridge components and categories of works that can potentially be carried out to that bridge component, for example: -

- Removal of vegetation from the bridge surface, parapets and embankments;
- Sweeping and cleaning the bridge deck;
- Patching of potholes, surface dressing and sealing of pavement cracks;
- Masonry repair and repointing;
- Patch-painting of steel;
- Repair of parapets, fences and safety barriers;
- Clearance of debris from the watercourse; and,
- Cleaning of graffiti.

Year 1 of the contract has been completed and routine maintenance works were conducted at bridges for which TII issued Screening for AA determinations where the proposed works were not likely to have significant effects on a European site. Year 2 of the contract is currently being progressed. However, proposed 2018 works at bridges that did not 'Screen out' are the subject of this assessment.

Throughout the project, progress meetings are regularly held during the year between Atkins, TII and the Contractor. During these meetings all aspects of the project are discussed, including those relevant to ecological assessments. This is to ensure that all aspects of the project are being accounted for and consistency is being maintained throughout. The full list of EIRSPAN bridge components and works are listed in Table 1-1 below.

Table 1-1 EIRSPAN bridge components and works.

Bridge Component	Works
1.0 Bridge Surface	12 Sealing of pavement cracks
	15 Maintenance of kerb stones
	16 Patching of potholes
	20 Pavement remedial works
	21 Sweeping and cleaning
	30 Cleaning of drain gullies
	32 Establish drainage facility
	34 Hosing of drainage system
	99 Miscellaneous works
2.0 Expansions Joints	10 Cleaning of expansions joints
	14 Maintenance of joint
	99 Miscellaneous works
3.0 Footways/ median	12 Sealing of pavement cracks
	02 Installation of rubbing strip
	21 Sweeping and cleaning
	22 Maintenance of surface
	99 Miscellaneous works
4.0 Parapets/ Safety barrier	03 Removal of vegetation
	50 Concrete repairs
	54 Maintenance of bedding mortar
	55 Repair of parapet
	59 Removal of graffiti
	60 Masonry repointing
	61 Masonry repairs
	70 Patch-painting of steel
	72 Replacement of guardrail
	74 Tightening of bolts
	99 Miscellaneous works
5.0 Embankments/ Revetments	03 Removal of vegetation
	33 Establish drainage channel
	44 Maintenance of gabion
	45 Maintenance of slope protection

Bridge Component	Works
	47 Reshaping (imported materials)
	59 Removal of graffiti
	99 Miscellaneous works
6.0 Wing/Spandrel/Retaining Walls	03 Removal of vegetation
	50 Concrete repairs
	52 High-pressure hosing of surface
	53 Maintenance of joints
	56 Establish base protection
	57 Maintenance of base protection
	59 Removal of graffiti
	60 Masonry repointing
	61 Masonry repairs
	99 Miscellaneous
7.0 Abutments	03 Removal of vegetation
	35 Maintenance of drainage channel
	50 Concrete repairs
	52 High-pressure hosing of surface
	53 Maintenance of soft joints
	56 Establish base protection
	57 Maintenance of base protection
	59 Removal of graffiti
	60 Masonry repointing
	61 Masonry repairs
	99 Miscellaneous works
8.0 Piers	03 Removal of vegetation
	35 Maintenance of drainage channel
	50 Concrete repairs
	52 High-pressure hosing of surface
	56 Establish base protection
	57 Maintenance of base protection
	59 Removal of graffiti
	60 Masonry repointing
	61 Masonry repairs
	99 Miscellaneous works
9.0 Bearings	50 Concrete repairs
	54 Maintenance of bedding mortar
	58 Cleaning of bearings
	70 Patch-painting of steel
	99 Miscellaneous works
10.0 Deck/slab/arch barrel	31 Cleaning of drip-tubes
	50 Concrete repairs

Bridge Component	Works
	52 High-pressure hosing of surface
	59 Removal of graffiti
	60 Masonry repointing
	61 Masonry repairs
	70 Patch-painting of steel
	99 Miscellaneous
11.0 Beams/girders/transverse beams	50 Concrete repairs
	52 High-pressure hosing of surface
	59 Removal of graffiti
	70 Patch-painting of steel
	99 Miscellaneous works
12.0 Riverbed	01 Clearance of watercourse
	04 Scour repairs
	99 Miscellaneous works
13.0 Other elements	50 Concrete repairs
	59 Removal of graffiti
	80 Repair of lighting
	99 Miscellaneous works
14.0 Structure in general	05 Removal of signage
	50 Concrete repairs
	59 Removal of graffiti
	81 Maintenance of structure ID
	99 Miscellaneous works

1.1.1. Procurement of Specialist Surveys

Specialist surveys are procured for each year of the contract, in particular for bats and freshwater pearl mussel. The bridges surveyed each year are dependent on the nature and extent of works to be carried out and the potential for such species to be present at the site, and in the case of freshwater pearl mussel, downstream of the site. Where relevant, the results of these surveys inform the Screening for Appropriate Assessment decisions. All survey data is inputted to the project Geographical Information System database.

Under the contract the Contractor has to appoint an ecologist for the duration of the contract to carry out pre-construction surveys, such as invasive species and bats surveys, and oversee the ecological requirements of the project. All generated reports relating to AA, TII AA determinations and survey data are provided to the Contractor and their appointed ecologist.

2. Project Description

This section describes the different elements of the routine maintenance works. A more detailed description of each element is in the Work Requirements Specifications. As the Bridge Term Maintenance contract is a four-year contract, the Work Requirements detail the full scope of works that may be utilised by a Contractor during that time. However, it is important to note that not all work items will be carried out at a bridge within a specific year of the contract. It may also be the case, depending on the condition of a bridge, that certain work items may not be necessary at a bridge during the duration of the contract. Thus, the works detailed in the Work Orders are specific to each bridge for a specific year of the contract.

In order to carry out the proposed works, access to a bridge is via existing road networks, as all bridges under the Contract are located on national roads. Given the nature and scale of the proposed works, access to the bridge will be in the immediate vicinity of the bridge. As detailed under 'Clearance of Watercourse', obstructions up to 20m upstream or downstream of the bridge may require removal. However, that is the maximum distance envisaged from a bridge where works are likely. Thus, all works are localised and specific to that bridge.

The frequency and duration of works at a bridge will be over a short time period. The Contractor will schedule the works required at a bridge based on the availability of work crews and resources. Thus, the Contractor may visit a bridge once and carry out the works detailed in the Work Order for that bridge, or the Contractor may visit the bridge on multiple occasions and only carry out particular work items on each occasion. With both scenarios the duration of work at a bridge will be short and temporary but may vary from 1-2 hours over a number of visits or 1-2 days on a single visit.

2.1. Proposed Works

As detailed above, the Year 1 Work Orders were screened for AA and TII issued determinations for each structure. This resulted in 28 bridges being '*Screened In*', i.e. where likely significant effects could not be ruled out, requiring those structures to undergo Appropriate Assessment.

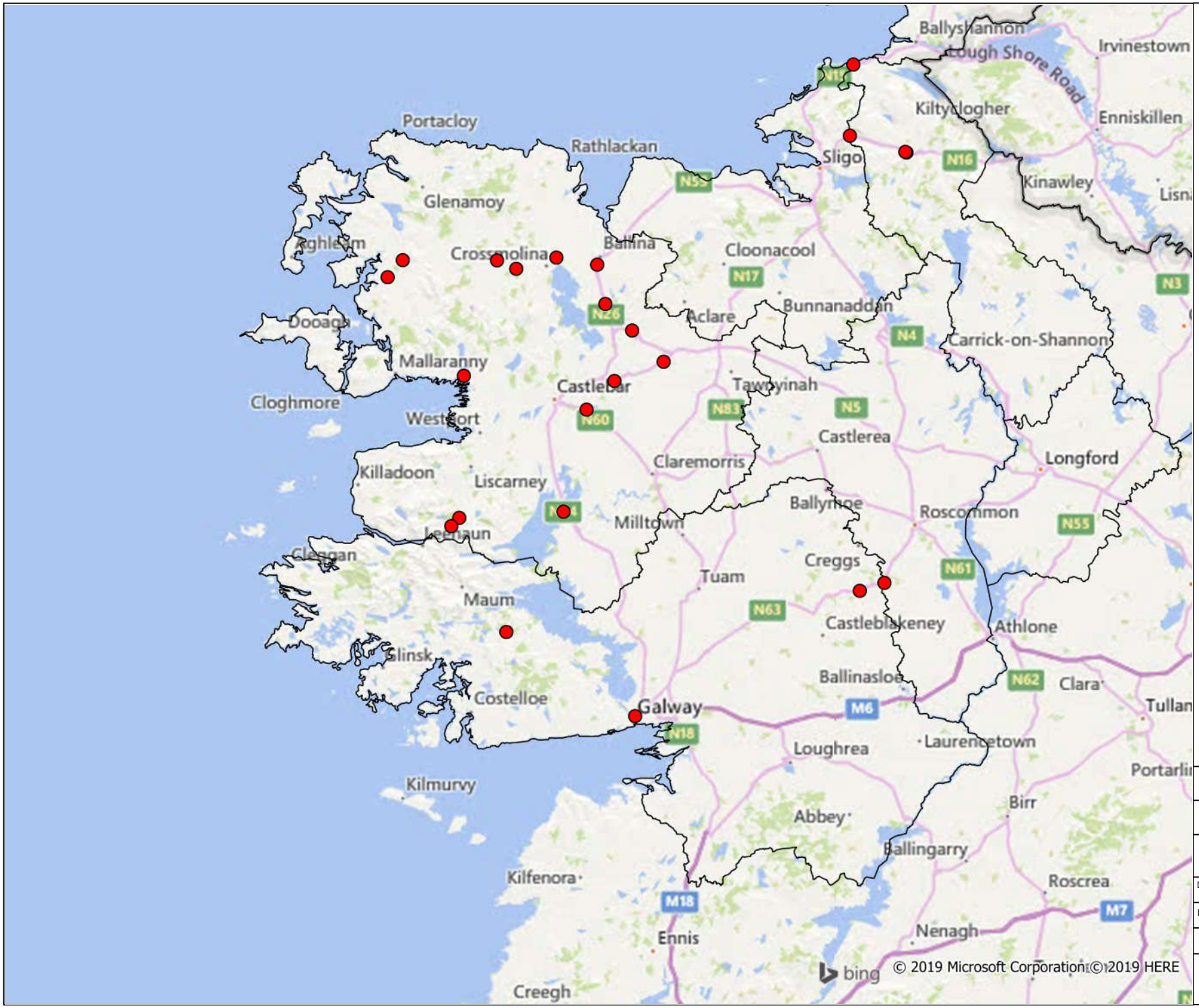
These 28 bridges are located in Counties Donegal (no. 7), Galway (no. 4), Leitrim (no. 4), and Mayo (no. 13), which is illustrated in Figure 1-1. Table 1-2 summaries the main details pertaining to each of the 28 bridges.

The works proposed at each bridge is contained in Section 5.8. The Work Orders detail the bridge identification number and name, the component of the bridge to which a work item is proposed, the work item and the quantity (m^2) expected to be carried out. A summary of the work categories proposed at each bridge is detailed in Table 2-1.

Table 2-1 Summary details of bridges requiring Appropriate Assessment.

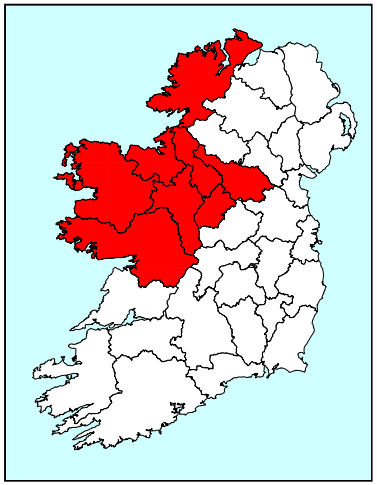
County	Structure ID	Structure Name	Road/River Bridge	Watercourse Name (EPA)	Water Framework Directive Sub-catchment	GPS Coordinates (ITM) X	Y
Donegal	DL-N15-014.00	Drumrath Bridge/Laghey to Ballybofey Rd	River	Drumenny	Eske_SC_010	594635	878279
Donegal	DL-N56-001.00	River Eske Bridge	River	Eske 37	Eske_SC_010	593769	879199
Donegal	DL-N56-006.00	Eddrim Bridge	Sea bay	Donegal Bay		589457	877779
Donegal	DL-N56-033.00	Gweebarra Bridge	River	Undefined		579683	899535
Donegal	DL-N56-046.00	Bedlam Bridge	River	Glenna	Tullaghobegly_SC_010	590984	929961
Donegal	DL-N56-055.90	N56 Barnes Bridge	River	Undefined	Leannan_SC_020	610385	923588
Donegal	DL-N56-060.00	Milltown Bridge	River	Leannan	Leannan_SC_020	614456	919988
Galway City	GB-N06-006.00	Terryland River Bridge No.3	River	Terryland	Corrib_SC_010	530157	726361
Galway County	GC-N59-038.00	Letterfore Bridge	River	Undefined	BallycuirkeLoughStream_SC_010	504174	743951
Galway County	GC-N63-015.00	Drinaun Bridge	Non-EPA	Undefined	Suck_SC_050	576168	751404
Galway County	GC-N63-019.00	Mount Talbort Bridge	River	Suck	Suck_SC_060	581151	752996
Leitrim	LM-N15-002.00	Banduff River Bridge	River	Duff	Duff_SC_010	575395	856930
Leitrim	LM-N16-012.00	Pollboy Bridge West	River	Shanvaus 35	Bonet_SC_010	585912	839414
Leitrim	LM-N16-013.00	Pollboy Bridge East	River	Shanvaus 35	Bonet_SC_010	585690	839528
Leitrim	LM-N16-018.00	Meenaphuill Bridge	River	Undefined	Drumcliff_SC_010	574642	842806
Mayo	MO-N05-014.00	Little River Bridge	River	Little [Strade]	Moy_SC_070	526994	794281
Mayo	MO-N26-001.00	Rahans Bridge	River	Tullyegan 34	Moy_SC_100	523877	817645
Mayo	MO-N26-003.00	Coolcronaun Bridge	River	Shanclough	Moy_SC_100	525375	809748
Mayo	MO-N26-007.00	Carrick Bridge	River	Carrow Loughs (Stream)	Moy_SC_090	530701	804362

County	Structure ID	Structure Name	Road/River Bridge	Watercourse Name (EPA)	Water Framework Directive Sub-catchment	GPS Coordinates (ITM) X	Y
Mayo	MO-N59-003.00	Knockadangan Bridge	River	Deel [Crossmolina]	Deel[Crossmolina]_SC_020	515750	819217
Mayo	MO-N59-006.00	Coolturk Bridge	Non-EPA	Undefined	Deel[Crossmolina]_SC_010	507639	817100
Mayo	MO-N59-008.00	Eskeragh Bridge	River	Fiddaunatooghaun	Deel[Crossmolina]_SC_010	503857	818885
Mayo	MO-N59-026.00	Lagduff Bridge	River	Undefined	Owenmore[Mayo]_SC_030	481846	816024
Mayo	MO-N59-042.00	Burrishoole Bridge	River	Undefined	Srahmore_SC_010	496683	795900
Mayo	MO-N59-063.00	Gowlan Bridge	River	Undefined	Erriff_SC_010	495114	767282
Mayo	MO-N59-066.00	Glenacally Bridge	River	32G04	Erriff_SC_010	493453	765668
Mayo	MO-N60-002.00	Manulla Bridge	River	Manulla 34	Castlebar_SC_020	521268	788617
Mayo	MO-N84-005.00	Keel Bridge	River	Aghinish 30	Aghinish_SC_010	516230	768106



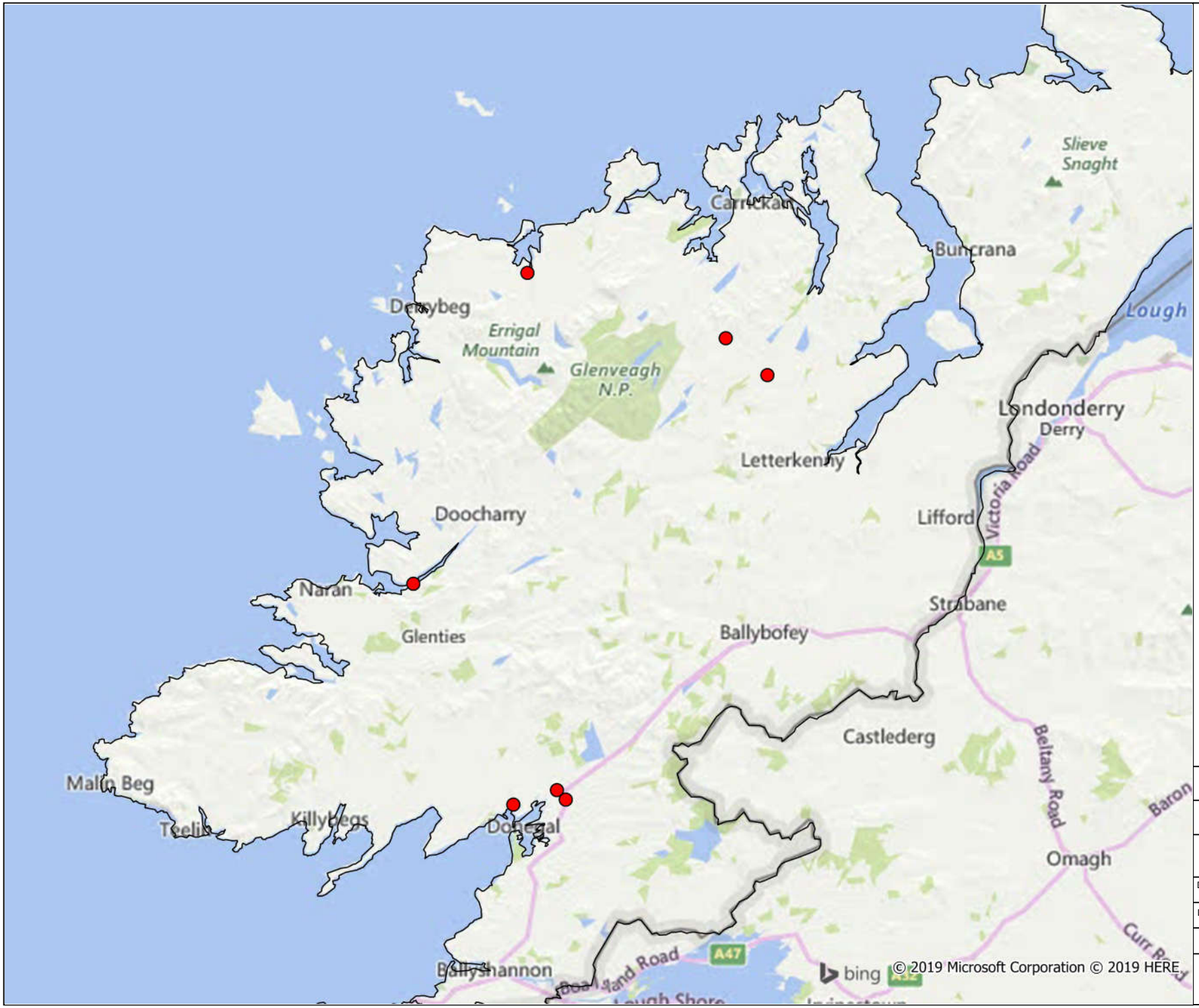
N

Year 1 NIS Structures



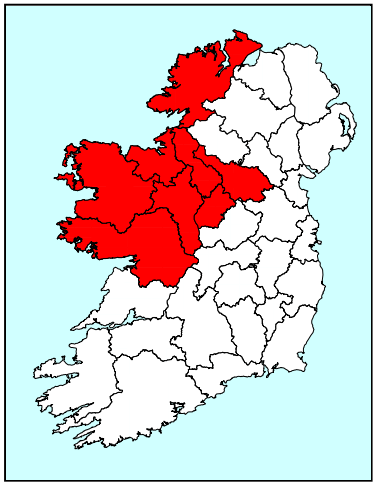
Client: Transport Infrastructure Ireland		
Project: NW Term Maintenance Contract No.3		
Title: Location of Structures (Galway, Mayo and Leitrim)		
Drawn: NS	Checked: POD	Authorised: POD
Date: 20/06/2019	Date: 20/06/2019	Date: 20/06/2019
Drawing No: Figure 1-1		Rev: 0

ATKINS
Dublin - Tel: 353 - 1 - 890 9000
Cork - Tel: 353 - 21 - 429 0300
Galway - Tel: 353 - 91 786050



N

Year 1 NIS Structures



Client:	Transport Infrastructure Ireland		
Project:	NW Term Maintenance Contract No. 3		
Title:	Location of Structures (Donegal)		
Drawn: NS	Checked: POD	Authorised: POD	
Date: 20/06/2019	Date: 20/06/2019	Date: 20/06/2019	
Drawing No: Figure 1-2		Rev: 0	

ATKINS
Dublin - Tel: 353 - 1 - 890 9000
Cork - Tel: 353 - 21 - 429 0300
Galway - Tel: 353 - 91 786050

2.1.1. Works Descriptions

2.1.1.1. Sweeping and Cleaning

All debris, silt and vegetation shall be removed from the bridge surface (i.e. the bridge deck) using a mechanical road sweeper or other appropriate means. No road sweepings are to be allowed enter the river.

2.1.1.2. Patching of potholes, surface dressing and sealing of pavement cracks

All dirt, debris and vegetation shall first be removed from the bridge surface either by sweeping with a brush, using a power hose (airline) or manual raking out. No dirt, debris and / or vegetation will enter a watercourse. Cracks shall be sealed with hot poured bitumen or similar approved product. Potholes will be cleaned of loose debris, broken back and reinstated in accordance with CC-SD-00705 using macadam or similar approved surfacing material compatible with the existing. Surface dressing shall be carried out by applying a bituminous coat and then dressing with stone similar in size to the existing road surface.

2.1.1.3. Cleaning of Drains and Gullies

All drain gullies on or adjacent to structures shall be cleaned of silt, debris and vegetation and all deposits removed for off-site disposal in line with Waste Regulations. The contents of any rodded gully / outlet material cannot be pushed out into / discharged to the watercourse; where required it may be necessary to plug the end of a gully / drain when completing works to prevent material entering the river before such material can be safely removed from site (e.g. by suction).

All gully connections and outlet pipes shall be cleared to ensure the unimpeded flow of water from the gullies and through the drainage outlets. No discharge of waste is permitted on site. Where existing drainage channels are present, these shall be re-profiled. Where drainage channels do not exist and are required, these shall be established by excavating a water cut in the soft verge and drain into the road embankment. Drainage channels will not drain directly to a watercourse.

2.1.1.4. High pressure power hosing of surfaces

Any growth (fungal, algae, etc.) on bridge components shall be removed by high pressure hosing or by using a stiff brush or hand-scraper (note that power hosing of masonry structures is not permitted). The water shall be clean, fresh and potable and obtained from a public utility watermains. Pumping of water directly from a watercourse for use is not permitted. Due to the nature of masonry structures, sand/ grit hosing will not be carried out on masonry bridges.

It may be necessary to pre-treat staining with a suitable herbicide / fungicide prior to hosing. It is critical in such circumstances that the user knows where, when and under what circumstances such products can be used and follows instructions for use as set out on the product label, with particular attention given to safe use near water.

The legislation around the permitted use of pesticides and plant protection products is complex and evolving. For details of the Sustainable Use of Pesticides please refer to the DAFM webpage at: - http://www.pcs.agriculture.gov.ie/sud/. This includes a link to the *Irish National Action Plan for the Sustainable Use of Pesticides (Plant Protection Products)* published in February 2019.

The legislation governing the sustainable use of pesticides includes the following: -

- Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides ('Sustainable Use of Pesticides Directive'); and,
- European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. No. 155 of 2012).
- European Communities (Sustainable Use of Pesticides) (Amendment) Regulations, 2019 (S.I. No. 438 of 2019).

The legislation governing the use of plant protection products includes: -

- Regulation (EC) No. 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC (hereinafter referred to as the 'Plant Protection Products Regulation'); and,

- European Communities (Plant Protection Products) Regulations, 2012 (S.I. No. 159 of 2012).

Article 12 (1) (b) of the European Communities (Plant Protection Products) Regulations, 2012 states that pesticides and / or plant protection products cannot be applied within a *European site within the meaning of Regulation 2 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011)*.

However, Article 12 (2) states: - "*Where a person, having completed a risk assessment, is obliged to use a pesticide in an area referred to in paragraph (1), he or she shall ensure that preference is given to the use of low risk plant protection products or biological and cultural control measures and where such measures are not capable of performing the necessary function, a person shall prioritise the use of plant protection products that are not classified as R50 in accordance with Directive 1999/45/EC of the European Parliament and of the Council of 31 May 19993 as amended by Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 . (3) Where a person uses a pesticide in an area referred to in paragraph (1) the onus of proof will lie with that person to show that there was no viable alternative and appropriate risk management measures were put in place.*

In the wider environment, we would recommend that where possible the use of pesticides and plant protection products is avoided. Priority should be given to the use of non-chemical and natural alternatives. Where the use of pesticides and / or plant protection products cannot be avoided the importance of ensuring that products are used in accordance with the product label cannot be over emphasised.

The Plant Protection Products Regulations provides that the Minister for Agriculture, Food and the Marine may establish a register of authorised products. If the Contractor is proposing to use any such products they should check to ensure that the product proposed is entered on the register (see http://www.pcs.agriculture.gov.ie/products/). Specifically, under Regulation 12(2) the user shall ensure that preference is given to the use of low risk plant protection products or biological and cultural control measures. Where measures are not capable of performing the necessary function, a person shall prioritise the use of plant protection products that are not classified as R50 in accordance with Directive 1999/45/EC of the European Parliament.

Furthermore, under Regulation 5(1) of the Sustainable Use of Pesticides Regulations 2012, the user of pesticides shall, subject to exception, "*hold a certificate confirming that the professional user has trained to a standard determined by the Minister in the subjects listed in Annex I of the Directive*", and "*comply with any additional training requirements as determined by the Minister*". The Contractor must be able to demonstrate that any staff applying pesticides and / or plant protection products carries such certification.

Should the Contractor propose to use pesticides and / or plant protection products they must set details such as maximum dose / hectare in each application; number of applications; period between applications etc. as part of an Integrated Pest Management Plan / Invasive Species Management Plan, with records of usage to be retained in line with Article 67(1) of the Regulations.

If it is proposed that an herbicide will be used to remove vegetation from masonry, this will be a herbicide approved for use near water, such as certain glyphosate products. Glyphosate has a low known toxic effect on aquatic life. The water required to make a solution in line with the product label will be sourced from a private source (pre-collected and stored) and not from the river.

2.1.1.5. Cleaning and Maintenance of Expansion Joints

Expansion joints will be cleaned by either sweeping clean with a brush or airline/ hose. No arisings are to be allowed enter the river. Damaged joints shall be repaired using a macadam material or one

compatible with the existing material. Seals that are missing of in poor condition shall be removed, cleaned and replaced. There shall be no discharge of waste on site. Note that expansion joints are not hydrologically linked to the watercourse being crossed.

2.1.1.6. Installation of rubbing strips

Rubbing strips are concrete verges on the bridge put in place to keep traffic away from the bridge parapet. Rubbing strips will be installed at bridges by extending the existing road pavement. Where required, the existing surface will be broken up and removed. All excavated material will be disposed of off-site. There will be no discharge of waste on-site.

2.1.1.7. Vegetation Removal

On embankments and revetments, all trees, bushes, ivy and deep-rooted vegetation within 1m of a structure shall be removed down to ground level. If vegetation greater than 1m from a structure is deemed a threat to the integrity of a structure, this shall also be removed. In the case of wing/spandrel and retaining walls, all vegetation rooted in, undermining or otherwise affecting their integrity shall be removed to avoid damage to the walls.

The stumps of vegetation with a diameter greater than 100mm shall have horizontal saw cuts made into the stump to promote natural rotting. The removal of mould/fungus or algae will be achieved using high pressure hosing, stiff brush or hand-scraper. Herbicide will not be used on vegetation which is not on the bridge structures.

Removal of Ivy and similar plants from bridge surfaces may include the use of herbicide prior to mechanical removal. The use of any chemical to assist in the removal of vegetation from structures must be approved by the Employer's Representative and be undertaken under the advice of an appropriately trained and registered pesticide advisor. Herbicides must be of a type approved for use near water and must be used in accordance with the manufacturer's instructions. Only appropriately trained and registered users may carry out the application of herbicides. There will be no discharge of waste on-site.

Note: please also refer to the text relating to the use of herbicides detailed in Section 2.1.1.4 above.

2.1.1.8. Clearance of watercourse

Many watercourses support in-stream vegetation, including examples of the Annex I habitat watercourses of plain to montane levels with Ranunculion fluitantis and Callitricho-Batrachion vegetation (3260); also known as floating river vegetation.

The purpose of this work item is to clean a channel of all obstructions, debris and vegetation that may impede flow. This includes items such as household or domestic items dumped in the channel, tree branches, concrete or masonry rubble or other objects that have become lodged between abutments and/or piers, within pipes, or debris build up under the structure. This may also include obstructions up to 20m upstream or downstream of the bridge. Naturally occurring aquatic vegetation growth in the channel shall not be cut back.

Excessive overgrowth of brambles etc. from adjacent embankments, which is impeding flow, will be cut back by manual means only. Heavy machinery is not permitted in the channel.

For de-silting of heavily silted culverts, the use of specialist drain clearing suction rigs will be required. No discharge of waste is permitted on site. Resulting deposits will be transported to and disposed of at a licensed waste facility.

2.1.1.9. Masonry repair and repointing

Repointing will be undertaken by stonemasons who have attended the TII approved 'Masonry Arch Bridge Repair Workshop' or are members of the Guild of Master Craftsmen. Repointing will be done by hand only. Masonry will be repointed by first cleaning the area by removing all vegetation and algae from the wall faces and arch barrel soffits, as described above.

Lime mortar will be used for all masonry repointing and repair. Where large areas are to be repointed, repointing must be undertaken in a fashion that prevents lime mortar from entering the aquatic ecosystems.

2.1.1.10. Patch-painting of steel

Steelwork with damaged, missing, flaking or otherwise poor condition paintwork shall be touch repainted over the defective areas. The surface will be exposed to bare steel using a wire brush. The steel will then be painted using a similar colour and thickness in accordance with the manufacturer's guidelines. No discharge of waste will be permitted on site. All waste arising must be removed from site.

2.1.1.11. Cleaning of graffiti

Graffiti can be removed using a variety of techniques depending on the structure. These may include water-soluble sprays and aerosols, gels and poultices, and high-pressure hosing, stiff brush and abrasives when so approved by the Employers Representative. Mechanical abrasive graffiti removal shall be carried out as a last resort by specialist firms and should only be carried out on uncoated concrete substrates. Typical methods include lower pressure water cleaning with or without detergents as well as sand or grit blasting. Note that certain methods of graffiti removal and / or graffiti removers may harm the surrounding finish and therefore will not be permitted for use. In contrast, others might be too weak and ineffective against spray paint.

The majority of graffiti encountered on bridge structures consist of spray-applied paint. Graffiti caused by spray-applied paints shall be removed using a water-based cleaning gel. The gel shall be applied to the affected area with a brush in a circular motion. After a short waiting time (generally ca. 20 minutes) the mixture of paint and gel shall be washed off with water (either by hand or using low pressure hosing), collected and disposed of offsite in a suitable waste disposal facility. No wastewater containing removal agents will be allowed to enter the surrounding environment. This approach is compatible with most sites; where graffiti is predominantly encountered on dry bridges (e.g. footpaths) and on those parts of the bridge structure away from the water.

In all cases the appointed Contractor will confirm the approach they propose to use for graffiti removal and what chemicals, if any, are to be used. This is to be reviewed and signed off by the Resident Engineer on behalf of TII, with ecological advice sought as appropriate. Where working closer to water only those chemicals/ gels approved for use near water can be used to remove graffiti.

During project progress meetings it was decided by TII that cleaning of graffiti would only be undertaken in areas that are visible to the public. Any graffiti removal from bridge archways spanning waterbodies and other sensitive environmental areas will not be undertaken.

2.1.1.12. Maintenance of gabions

Damaged gabions shall be repaired wherever feasible using similar wire to the original. Missing stone infill shall be made good with stone of similar type and size. Gabions considered beyond repair shall be carefully removed so as to avoid all undue disturbance to the embankment and new gabions filled with the recovered or similar stone installed. New gabions shall have a Roads and Bridges Agreement Certificate and shall match as closely as possible the existing gabions.

Gabions showing signs of or being at risk of excessive settlement shall be carefully removed, footings/foundations made good and compacted and the gabions reinstated. Any actual or likely significant slope instability shall be reported to the Employers Representative.

It should be noted for the Bridge Term Maintenance Contract for the North West region the scope of works for maintenance of gabions is limited to the removal of vegetation.

2.1.1.13. Reshaping (imported materials)

Earth embankments and slopes shall be re-profiled to the original slope using recovered soil or suitable imported fill if soil is not available on site. All imported material is subject to approval by the Employers Representative.

2.1.1.14. Maintenance of slope protection

Slope protection includes gabions, rock revetments, paving slabs, paviors, in situ concrete, stone or other materials placed specifically to protect an embankment slope. Slope protection shall be maintained by replacing missing, damaged or otherwise poor condition units. Unstable or displaced units shall be reinstated in a manner to match the existing bedding. Soft spots occurring beneath unstable or displaced units shall be excavated out and replaced with suitable compacted stone fill to cl.804 of TII Specification for Works.

2.1.1.15. Concrete Repairs

Concrete repairs can be carried out to bridge elements such as wing and spandrel walls, abutments, piers, arch barrels and transverse beams and girders. Concrete repairs will be carried out where minor areas of defective concrete are identified as needing repair.

Cracked, honeycombed, delaminated, contaminated or otherwise defective concrete will be broken out by hand-held drill/impact hammer, taking due care to avoid damage to sound concrete and reinforcement.

Before cutting out, the Contractor shall determine the position and depth of the reinforcement. The perimeter of the concrete to be removed shall be saw cut perpendicularly to the face of the concrete to a depth of not less than 10 mm or to within 10mm of the reinforcement, whichever is the lesser. The concrete shall be removed using suitable hand or mechanical tools or high-pressure water jetting. Where concrete is removed by high pressure water jetting a lightweight electric demolition hammer may be used for final trimming of the area broken out.

Waste material from the above operations shall be removed offsite. The Site shall be kept free of debris or standing water arising from the jetting activities. All proprietary materials shall be stored in a dry weather-proof lock up store free from extremes of cold or heat in accordance with the manufacturer's instructions. The materials shall not be removed from the store for use until immediately prior to mixing. Repairs shall only be undertaken by Contractors who are able to demonstrate suitable experience and a proven track record dealing with concrete repairs.

2.1.1.16. Establishing base protection

Base protection is likely to be required around wing/ spandrel/ retaining walls, abutments and piers.

Bridge components that have been identified as at risk of undermining, by washout, embankment instability or other means, will have mass concrete of not less than Grade C20/25 placed and compacted in any void on an apron of not less than 300mm depth (below ground level) and 300mm width provided immediately in front of the bridge component, as specified by the Works Orders. When working within the river channel the Contractor shall adhere to the requirements listed in the relevant sections of the Works Requirements Specification.

Scour holes will be filled with Class C1 material as per the TII Specification for Road Works Series 600. C1 material is dry coarse granular material for use as a general fill material.

Table 2-2 Summary Table of Work Categories for each bridge.

County	Structure_ID	01 Clearance of watercourse	03 Removal of vegetation	04 Scour repairs	44 Maintenance of gabion	45 Maintenance of slope protection	47 Reshaping (imported materials)	50 Concrete repairs	52 High-pressure hosing of surface	55 Repair of parapet	59 Removal of graffiti	60 Masonry repointing	61 Masonry repairs
Donegal	DL-N15-014.00	Y	Y	N	N	N	N	N	N	N	N	N	N
Donegal	DL-N56-001.00	N	Y	N	N	N	N	Y	N	N	Y	N	N
Donegal	DL-N56-006.00	N	Y	N	N	N	N	N	N	N	N	Y	N
Donegal	DL-N56-033.00	N	Y	N	N	N	N	Y	N	N	N	N	N
Donegal	DL-N56-046.00	N	Y	N	N	N	N	N	N	N	N	Y	N
Donegal	DL-N56-055.90	Y	Y	N	N	N	N	Y	N	N	N	N	N
Donegal	DL-N56-060.00	Y	Y	N	N	N	N	N	N	N	N	N	N
Galway City	GB-N06-006.00	N	Y	N	N	N	N	Y	N	N	N	N	Y
Galway County	GC-N59-038.00	N	Y	N	N	N	N	Y	N	Y	N	Y	Y
Galway County	GC-N63-015.00	Y	N	N	N	N	N	N	N	N	N	N	N
Galway County	GC-N63-019.00	Y	Y	N	N	N	N	N	N	N	N	Y	Y
Leitrim	LM-N15-002.00	Y	Y	N	N	N	N	N	N	N	N	N	N
Leitrim	LM-N16-012.00	N	Y	N	N	N	Y	N	N	N	N	N	Y
Leitrim	LM-N16-013.00	Y	Y	N	N	N	N	N	N	N	N	N	Y
Leitrim	LM-N16-018.00	Y	Y	N	N	N	N	Y	N	N	N	Y	Y
Mayo	MO-N05-014.00	Y	Y	Y	N	Y	N	N	N	N	N	Y	Y
Mayo	MO-N05-022.00	N	Y	N	Y	N	N	N	N	N	N	N	N
Mayo	MO-N26-001.00	Y	Y	N	N	N	N	Y	N	N	N	N	N
Mayo	MO-N26-003.00	N	Y	N	N	N	N	N	N	N	N	N	Y
Mayo	MO-N26-007.00	Y	Y	N	N	N	N	N	N	N	N	N	N
Mayo	MO-N59-003.00	N	Y	N	N	N	N	N	Y	N	N	N	N
Mayo	MO-N59-006.00	N	Y	N	N	Y	N	Y	N	N	N	N	N
Mayo	MO-N59-008.00	N	Y	N	N	N	N	N	Y	N	N	N	N

County	Structure_ID	01 Clearance of watercourse	03 Removal of vegetation	04 Scour repairs	44 Maintenance of gabion	45 Maintenance of slope protection	47 Reshaping (imported materials)	50 Concrete repairs	52 High-pressure hosing of surface	55 Repair of parapet	59 Removal of graffiti	60 Masonry repointing	61 Masonry repairs
Mayo	MO-N59-024.00	Y	Y	N	N	N	N	N	N	N	N	Y	Y
Mayo	MO-N59-026.00	N	Y	N	N	N	N	N	N	N	N	Y	N
Mayo	MO-N59-042.00	Y	Y	N	N	N	N	N	Y	N	N	Y	Y
Mayo	MO-N59-063.00	Y	Y	Y	N	N	N	N	N	N	N	Y	N
Mayo	MO-N59-066.00	N	Y	N	N	N	N	N	N	N	N	Y	N
Mayo	MO-N60-002.00	N	Y	N	N	N	N	N	Y	N	N	N	N
Mayo	MO-N84-005.00	N	Y	N	N	N	N	N	Y	N	N	N	N

2.2. Bridge Descriptions

2.2.1. Donegal

2.2.1.1. Drumrath Bridge/Laghey to Ballybofey Rd. [DL-N15-014.00]

The structure is comprised of 2 corrugated steel pipes with 3.95m diameter each. There is steel safety barrier on both sides of the carriageway and a light steel railing on the headwalls. The structure carries the N15 over the River Drumenny. The structure is within Lough Eske and Ardnamona Wood SAC and located 3.2km upstream of the Donegal Bay SPA. Plate 2-1 shows the east elevation.

Plate 2-1 Drumrath Bridge.

2.2.1.2. River Eske Bridge [DL-N56-001.00]

The River Eske Bridge is a 3-span reinforced concrete arch bridge. The substructure piers consist of arched columns, with the end spans reinforced concrete slabs spanning from the arch to abutments. The mid-span is 14m and the side spans are 12.4m each. The structure is within Lough Eske and Ardnamona Wood SAC and located 1.7km upstream of the Donegal Bay SPA. Plate 2-2 shows the north elevation.

Plate 2-2 River Eske Bridge.

2.2.1.3. Eddrim Bridge [DL-N56-006.00]

The structure is comprised of 3 precast reinforced concrete pipes with 1.8m diameter each. There are masonry parapets on both sides of the carriageway. The riverbed is tidal. The structure is within the Donegal Bay (Murvagh) SAC and the Donegal Bay SPA. Plate 2-3 shows the south elevation.

Plate 2-3 Eddrim Bridge.

2.2.1.4. Gweebarra Bridge [DL-N56-033.00]

The Gweebarra Bridge is a 11-span reinforced concrete arch bridge with in-situ concrete parapets on both sides of the carriageway. The maximum span is 18.29m and the minimum span is 8.80m. Spans 3/5/7/9 are suspended spans of 8.64m length. The structure is within the West of Ardara/Maas Road SAC. Plate 2-4 shows the west elevation.

Plate 2-4 Gweebarra Bridge.

2.2.1.5. Bedlam Bridge [DL-N56-046.00]

The Bedlam Bridge is a 9.12m single span masonry arch bridge with masonry arch extension. There are masonry parapets on both sides of the carriageway. The rise of arch barrel at crown is 3.74m. The structure carries N56 over the River Glenna. The Plate 2-5 shows the south elevation.

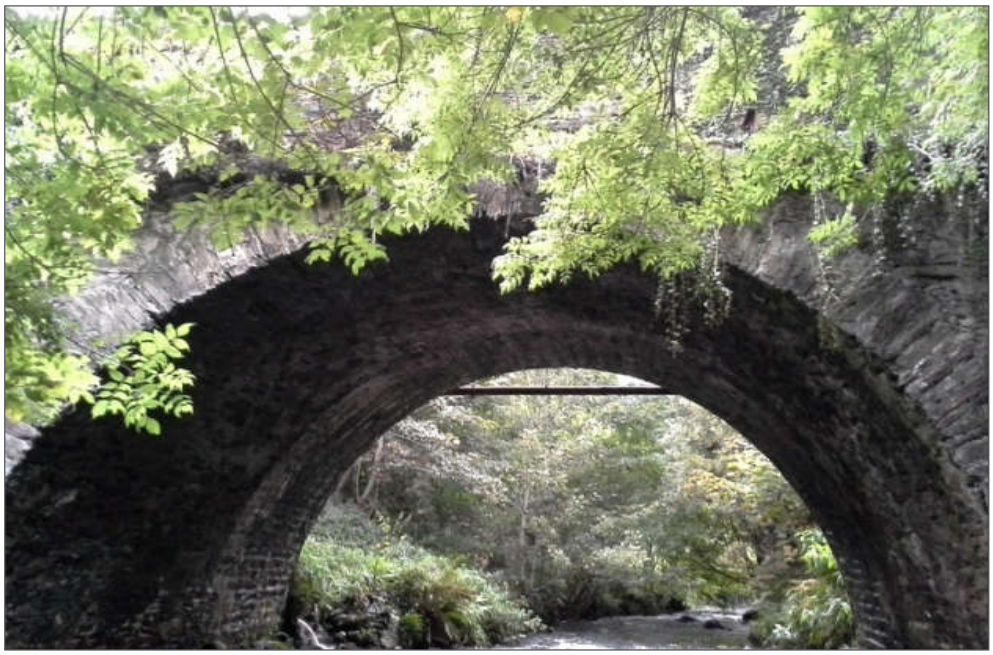


Plate 2-5 Bedlam Bridge.

2.2.1.6. N56 Barnes Bridge [DL-N56-055.90]

The N56 Barnes Bridge is a 4.2m single span reinforced concrete structure. The bridge is a portal structure constructed of precast inverted U-shaped units on concrete base. There are steel safety barriers before the masonry parapets on both sides of the carriageway. The structure is located 3.2km upstream of the Leannan River SAC and 10.4km upstream of the Lough Fern SPA. Plate 2-6 shows the west elevation.

Plate 2-6 N56 Barnes Bridge.

2.2.1.7. Milltown Bridge [DL-N56-060.00]

The Milltown Bridge is a 14.59m single span reinforced concrete bridge with steel parapets on both sides of the carriageway. The structure carries N56 over the River Leannan. The structure is within the Leannan River SAC and located 3km upstream of the Lough Fern SPA. Plate 2-7 shows the west elevation.

Plate 2-7 Milltown Bridge.

2.2.2. Galway City

2.2.2.1. Terryland River Bridge No.3 [GB-N06-006.00]

The structure is comprised of 2 corrugated steel pipes with 2.80m diameter each. Each culvert is in two sections. There is the galvanised corrugated steel pipe 15m in length to the east side and then a 5 degree kink to the second section which is also a corrugated steel pipe but with a bituminous coating. The structure is located 1.2km upstream of the Lough Corrib SAC and 3.7km upstream of the Inner Galway Bay SPA. Plate 2-8 shows the east elevation.

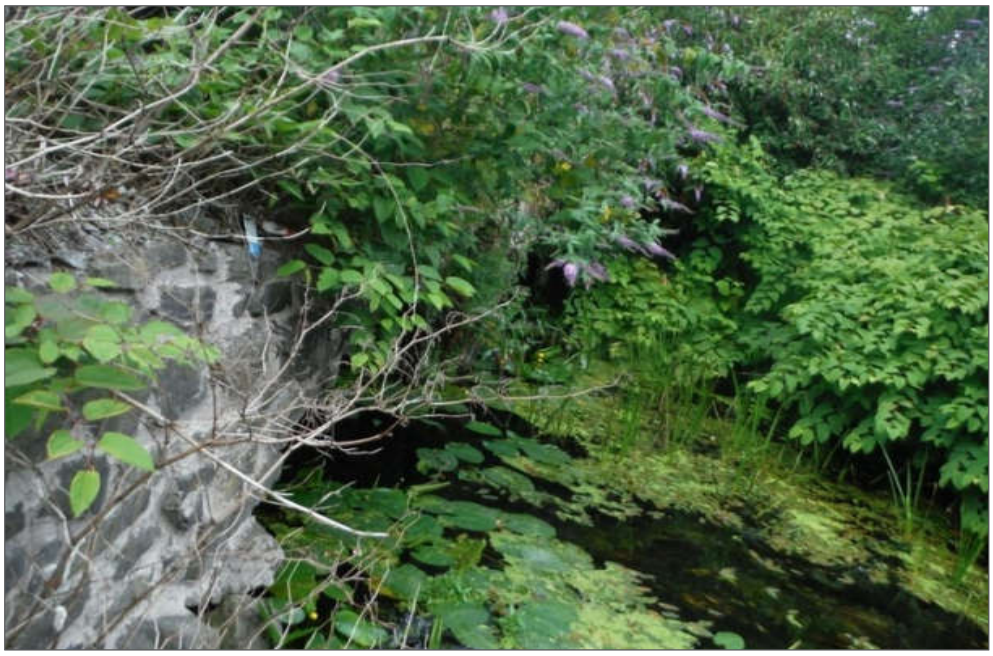


Plate 2-8 Terryland River Bridge No. 3.

2.2.3. Galway County

2.2.3.1. Letterfore Bridge [GC-N59-038.00]

The Letterfore Bridge is a 3.67m single span masonry arch bridge with reinforced concrete extension to north end. The rise of arch barrel at crown is 1.49m. The bridge is located in the Connemara Bog Complex SAC and located 12.6km upstream of the Lough Corrib SPA. Plate 2-9 shows the north elevation.

Plate 2-9 Letterfore Bridge.

2.2.3.2. Drinaun Bridge [GC-N63-015.00]

The Drinaun Bridge is comprised of 2 precast reinforced concrete pipes with 1.40m diameter each. There are concrete blockwall parapets on both sides of the carriageway. The structure is located 3.2km upstream of the River Suck Callows SPA. Plate 2-10 shows the north elevation.

Plate 2-10 Drinaun Bridge.

2.2.3.3. Mount Talbort Bridge [GC-N63-019.00]

The Mount Talbort Bridge is a 12-span masonry arch bridge carries N63 over the River Suck. The maximum span is 5.35m and the minimum span is 1.91m. All arches have been shotcreted. Each arch has two tie bars passing through its adjacent spandrel wall. The structure is within the River Suck Callows SPA. Plate 2-11 shows the east elevation.

Plate 2-11 Mount Talbot Bridge.

2.2.4. Leitrim

2.2.4.1. Banduff River Bridge [LM-N15-002.00]

The Banduff River Bridge is a 15.5m single span reinforced concrete bridge with steel parapets on both sides of the structure. The structure is within the Bunduff Lough and Machair / Trawalua / Mullaghmore SAC. Plate 2-12 shows the south elevation.

Plate 2-12 Banduff River Bridge.

2.2.4.2. Pollboy Bridge West [LM-N16-012.00]

The structure is a 6.1m single span masonry arch bridge with masonry parapets on both sides of the structure. The rise of arch span barrel at crown is 1.25m. The structure is within the Lough Gill SAC. Plate 2-13 shows the north elevation.

Plate 2-13 Pollboy Bridge West.

2.2.4.3. Pollboy Bridge East [LM-N16-013.00]

The structure is a 6.1m single span masonry arch bridge with masonry parapets on both sides of the structure. The rise of arch span barrel at crown is 1.26m. The structure is located 0.2km upstream of the Lough Gill SAC. Plate 2-14 shows the south elevation.

Plate 2-14 Pollboy Bridge East.

2.2.4.4. Meenaphuill Bridge [LM-N16-018.00]

The structure is a 3.05m single span masonry arch bridge with masonry parapets on both sides of the structure. The rise of arch span barrel at crown is 1.12m. The structure is within the Ben Bulben, Gleniff and Glenade Complex SAC. Plate 2-15 shows the south elevation.

Plate 2-15 Meenaphuill Bridge.

2.2.5. Mayo

2.2.5.1. Little River Bridge [MO-N05-014.00]

The Little River Bridge is a 3-span masonry arch bridge with reinforced concrete extension. The maximum span is 3.1m and the minimum span is 1.5m. The RC deck slab is simply supported on both abutments and bears directly onto a 25mm thick timber board. The bridge is located 5.6km upstream of the River Moy SAC. Plate 2-16 shows the north elevation.

Plate 2-16 Little River Bridge.

2.2.5.2. Rahans Bridge [MO-N26-001.00]

The original bridge is a 3.65m single span masonry arch structure. It has been extended by a 1.88m wide masonry arch on the west side and a 1.82m masonry arch on the east side which is extended further by a 2.55m wide corrugated steel arch and a 900mm wide concrete arch. There are masonry parapets on both sides of the carriageway. The structure is located 450m upstream of the River Moy SAC. Plate 2-17 shows the east elevation.

Plate 2-17 Rahans Bridge.

2.2.5.3. Coolcronaun Bridge [MO-N26-003.00]

The Coolcronaun Bridge is a 2-span masonry arch bridge with 1.56m span each. The rise of arch barrel at crown is 0.41m. There are masonry parapets on both sides of the carriageway. The structure is located 1.3km upstream of the River Moy SAC. Plate 2-18 shows the east elevation.

Plate 2-18 Coolcronaun Bridge.

2.2.5.4. Carrick Bridge [MO-N26-007.00]

The Carrick Bridge is a 3.35m single span masonry arch bridge with masonry parapets on both sides of the carriageway. The rise of arch barrel at crown is 1.22m. The structure carries N26 over the Stream Carrow Loughs. The structure is located 2.4km upstream of the River Moy SAC. Plate 2-19 shows the east elevation.

Plate 2-19 Carrick Bridge.

2.2.5.5. Knockadangan Bridge [MO-N59-003.00]

The Knockadangan Bridge is a 3-span reinforced concrete bridge carries N59 over the River Deel. The maximum span is 11.04m and the minimum span is 10.20. There are 24 pre-stressed precast beams in each span of the structure. There are drainage tubes through the deck in the western span. The structure is within the River Moy SAC and located 4.8km upstream of the Lough Conn and Lough Cullin SPA. Plate 2-20 shows the north elevation.

Plate 2-20 Knockadangan Bridge.

2.2.5.6. Coolturk Bridge [MO-N59-006.00]

The structure is a 3.04m diameter corrugated steel pipe culvert with masonry parapets on both sides of the carriageway. The structure is located 3km upstream of the River Moy SAC. Plate 2-21 shows the south elevation.

Plate 2-21 Coolturk Bridge.

2.2.5.7. Eskeragh Bridge [MO-N59-008.00]

The Eskeragh Bridge is a 4.08m single span in-situ reinforced concrete bridge which carries N59 over the River Fiddaunatooghaun. There are steel safety barriers before the aluminium railing parapets on both sides of the carriageway. The structure is within the Bellacorick Bog Complex SAC. Plate 2-22 shows the south elevation.

Plate 2-22 Eskeragh Bridge.

2.2.5.8. Lagduff Bridge [MO-N59-026.00]

The structure is a 2.43m single span masonry arch bridge with masonry parapets on both sides of the carriageway. The rise of arch barrel at crown is 1.21m. The structure is within the Owenduff/Nephin Complex SPA. Plate 2-23 shows the east elevation.

Plate 2-23 Lagduff Bridge.

2.2.5.9. Burrishoole Bridge [MO-N59-042.00]

The Burrishoole Bridge is a 3-span reinforced concrete bridge with aluminium railing parapets on both sides of the carriageway. The deck consists of 6 No. pre-stressed spaced beams with a reinforced concrete deck slab. The maximum span is 15.45m and the minimum span is 15.27m. The structure is within the Clew Bay Complex SAC. Plate 2-24 shows the south elevation.

Plate 2-24 Burrishoole Bridge.

2.2.5.10. Gowlan Bridge [MO-N59-063.00]

The structure is a 4.02m single span masonry arch bridge with masonry parapets on both sides of the carriageway. The rise of arch barrel at crown is 0.85m. The structure is within the Mweelrea/Sheeffry/Erriff Complex SAC. Plate 2-25 shows the east elevation.

Plate 2-25 Gowlan Bridge.

2.2.5.11. Glenacally Bridge [MO-N59-066.00]

The structure is a 9.05m single span masonry arch bridge with masonry parapets on both sides of the carriageway. The rise of arch barrel at crown is 4.8m. Bridge spans a tributary of the Erriff River. The structure is within the Mweelrea/Sheeffry/Erriff Complex SAC. Plate 2-26 shows the south elevation.

Plate 2-26 Glenacally Bridge.

2.2.5.12. Manulla Bridge [MO-N60-002.00]

The Manulla Bridge is a 9.12m single span reinforced concrete bridge with in-situ reinforced concrete extension. There are aluminium railing parapets on both sides of the carriageway. The structure is within the River Moy SAC. Plate 2-27 shows the north elevation.

Plate 2-27 Manulla Bridge.

2.2.5.13. Keel Bridge [MO-N84-005.00]

The Keel Bridge is a 11.55m single span steel and concrete composite bridge. There are masonry parapets on both sides of the carriageway. The structure is within the Lough Carra/Mask Complex SAC and Lough Carra SPA. Plate 2-28 shows the east elevation.

Plate 2-28 Keel Bridge.

3. Scope of Study

The purpose of this Natura Impact Statement (NIS) is to assess the potential for adverse effects, as a result of the proposed bridge maintenance works, on the integrity of Special Areas of Conservation and Special Protection Areas that were 'Screened-In' by the competent authority, TII.

3.1. Aims of the Report

The aim of this report is to provide supporting information to assist the competent authority, in this case TII, to carry out an Appropriate Assessment with respect to the proposed project.

3.2. Legislative Context

Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora, known as the 'Habitats Directive' provides legal protection for habitats and species of European importance. Article 2 of the Directive requires the maintenance or restoration of habitats and species of European Community interest, at a favourable conservation status. Articles 3 – 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservations of an EU-wide network of sites known as Natura 2000 sites. Natura 2000 sites are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC).

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans or projects that could potentially affect Natura 2000 sites. Article 6(3) establishes the requirement for Appropriate Assessment: -

> "*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*."

Article 6 (4) deals with the steps that should be taken when it is determined, as a result of Appropriate Assessment, that a plan or project will adversely affect a European site. Alternative solutions, imperative reasons of overriding public interest (IROPI) and compensatory measures need to be addressed in this case. Article 6(4) states: -

> "*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*."

3.3. Appropriate Assessment Process

Guidance on the AA process was produced by the European Commission (EC, 2018), which was subsequently used to develop guidance for Ireland by the Department of Environment, Heritage and Local Government in 2009 (DEHLG, 2009). These guidance documents set out a four-staged approach to complete the AA process and outlines the issues and tests at each stage.

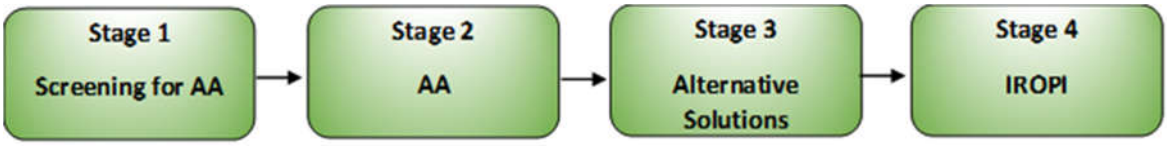


Figure 2-1 Appropriate Assessment Process (Source: DEHLG, 2009).

The stages outlined below are taken from the guidance document Appropriate Assessment of Plans and Project in Ireland – Guidance for Planning Authorities (DEHLG, 2009).

3.3.1. Screening for Appropriate Assessment

Screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3): -

i. Whether a plan or project is directly connected to or necessary for the management of the site, and

ii. Whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a Natura 2000 site in view of its conservation objectives.

If the effects are deemed to be significant, potentially significant, or uncertain, then the process must proceed to Appropriate Assessment.

3.3.2. Appropriate Assessment

Appropriate Assessment 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 competent authority can only agree to the plan or project after having ascertained that it will not adversely affect the integrity of the site(s) concerned. If this cannot be determined, and where mitigation cannot be achieved, the alternative solutions need to be considered and the process proceeds to the consideration of alternative solutions.

3.3.3. Alternative Solutions

This stage examines any alternative solutions or options that could enable the plan or project to proceed without adverse effects on the integrity of a Natura 2000 site. The process must return to Appropriate Assessment as alternatives will require assessment in order to proceed. Demonstrating that all reasonable alternatives have been considered and assessed, and that the least damaging option has been selected, is necessary to examine whether there are imperative reasons of overriding interest.

3.3.4. IROPI

This stage examines whether there are imperative reasons of overriding public interest for allowing a plan or project that will have adverse effects on the integrity of a Natura 2000 site to proceed in cases where it has been established that no less damaging alternative solution exists. Compensatory measures must be proposed and assessed, of which the Commission must be informed.

The AA process only progresses through the full process for certain plans and projects. For example, for a project not connected with the management of a site and where no likely significant effects on a Natura 2000 site in view of its conservation objectives are identified, the process stops at Stage for Appropriate Assessment. Throughout the process the precautionary principle must be applied, which requires that the conservation objectives of Natura 2000 should prevail where there is uncertainty (EC, 2001).

This report is a NIS that provides supporting information to the competent authority in their AA decision.

4. Methods

4.1. Guidance documents

This report was prepared with reference and due consideration to the following documents and case law, including but not limited to: -

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna (Habitats Directive);
- Statutory Instrument No. 477/2011 — European Communities (Birds and Natural Habitats) Regulations 2011;
- European Commission (2018). Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC;
- European Commission (2001). Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC;
- European Commission (2007). Guidance document on Article 6(4) of the 'Habitats Directive' 92/49/EEC; clarification of the concepts of: Alternative solutions, Imperative reasons of overriding public interest, Compensatory Measures, Overall Coherence, Opinion of the Commission;
- Department of the Environment, Heritage and Local Government (2009). Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities; and,
- Case C-323/17 People over Wind & Anor. v. Coillte.

4.2. Data Collation

As part of this assessment of the proposed project, Atkins developed a Geographic Information System (GIS) to store all ecological data relating to the bridge structures to facilitate the easy interrogation of data, both within the dataset and spatially.

The dataset contains information specific to each bridge, such as name, ID number, location co-ordinates, work order data (i.e. proposed works), subcatchment, location with respect to Natura 2000 sites, hydrological connectivity and ecological data (either 3rd party data or data obtained from surveys conducted under the current contract. This GIS is regularly updated with data such as incoming survey data on bats, invasive species and freshwater pearl mussel, obtained as a result of site surveys conducted by the Contractor's appointed ecologist.

At the outset, a desk study was carried out to collate information available on Natura 2000 sites in the vicinity of bridge sites. These areas were viewed using Google Earth, Google maps[1] and Bing maps[2] and NBDC mapviewer. All bridge locations were also stored as *.kml* files in GoogleEarth to allow sites to be easily located and reviewed.

Data sources for the GIS include: -

- EIRSPAN bridge locations and Work Orders.
- National Parks and Wildlife Parks (NPWS) spatial data: Natura 2000 boundaries, nationally designated site boundaries, Article 17 reporting records, *Margaritifera* sensitive areas.

[1] https://www.google.ie/maps
[2] http://www.bing.com/maps/

- Environmental Protection Agency datasets; Water/ Water Framework Directive datasets.
- National Biodiversity Data Centre online data.
- TII invasive species database.
- Species specific datasets obtained from NPWS, as a result of data requests. Some of these datasets are sensitive in nature, such as the distribution of freshwater pearl mussel in the region.
- Species specific data collected as part of ongoing ecological studies or site visits (e.g. data on invasive species collected by Contractor or Resident Engineer).

Geospatial analysis of all data was carried out using MapInfo v.16. In line with established best practice, locations and boundaries of all Natura 2000 sites connected via watercourses to proposed works were identified to establish surface water connectivity between work areas and Natura 2000 sites. The Environmental Protection Agency (EPA) Envision mapping[3] system and datasets were used to identify any hydrological connection between the proposed project and Natura 2000 sites.

Desktop information on relevant Natura 2000 sites were reviewed, including the site synopsis for each SAC/SPA, the conservation objectives, the site boundaries as shown on the NPWS online map viewer, the standard Natura 2000 Data Form for the SAC/SPA which details conditions and threats of the sites, and published information and unpublished reports on the relevant Natura 2000 sites.

Planning information from the surrounding area, dated within the last 5 years, was reviewed using the planning enquiry system MyPlan.ie. Search criteria were implemented to screen out such projects or plans that would not be relevant to this study. This was used to determine potential cumulative impacts from other plans / projects near the proposed works.

4.2.1. Consultation

At the outset of the North West Term Maintenance Contract No. 3 a consultation letter was sent to NPWS via the Development Applications Unit (DAU). Atkins / TII also met with Inland Fisheries Ireland at the outset of the project.

4.3. Statement of Authority

The NIS was prepared by Niamh Sweeney and Conor Ruane under the direction of Paul O'Donoghue.

Niamh Sweeney (BSc, MSc (Res)) is a freshwater ecologist with 8 years' experience in ecological consultancy, with specialisms in macroinvertebrate and diatom taxonomy. Niamh has worked on numerous Screenings for Appropriate Assessment, Natura Impact Statements and Ecological Impact Assessments for private architect firms, waste companies, numerous County Councils, the OPW and Inland Fisheries Ireland. Niamh carried out the preparation of this report. Conor Ruane has a BSc (Hons) in Environmental Science. Conor has worked in ecological and environmental consultancy since 2014, working on a wide range of projects including bridge works, road construction, and road maintenance works. A focus of Conor's work to date has been on conducting Appropriate Assessment screenings, ecological appraisals and supporting the preparation of Natura Impact Statements and Ecological Impact Statements. Conor carried out the preparation of this report. Paul O'Donoghue has a BSc (Zoology), MSc (Behavioural Ecology) and a PhD in avian ecology and genetics. His is a chartered member of the Society for the Environment (CEnv) and a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). Paul has over 18 years' experience in ecology; including extensive experience in the preparation of Habitat Directive Assessments / Natura Impact Statements (i.e. Appropriate Assessment under Article 6(3) of the EU Habitats Directive). Paul carried out the technical review of this report.

[3] http://gis.epa.ie/Envision

5. Appropriate Assessment

5.1. Connectivity of the Works Area to Natura 2000 Sites

The '*zone of influence*' (ZoI) for a project is the area over which ecological features may be subject to significant effects as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries. The zone of influence will vary for different ecological features depending on their sensitivity to an environmental change (CIEEM, 2018).

A distance of 15km is currently recommended in the case of plans, as a potential zone of influence, and this distance is derived from UK guidance (Scott Wilson *et al*., 2006). For some projects, the distance could be much less than 15km, and in some cases less than 100m, but National Parks and Wildlife Service guidance advises that this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects.

Given nature and scale of the proposed works and localised access requirements for the 28 bridges being considered in this assessment, the maximum distance where works are likely from a bridge is 20m upstream or downstream of a bridge. Thus, direct impacts are anticipated to occur within the immediate vicinity of the bridge.

All bridges being considered in this assessment span watercourses. Therefore, any Natura 2000 site located downstream of a bridge has the potential to be indirectly impacted by proposed works.

Thus, given the nature of the proposed project the potential zone of influence will be limited to Natura 2000 sites the encompass or are immediately adjacent to a bridge, or to those hydrologically connected to the proposed works at a bridge. Table 5-1 details the bridges, their location relative to Natura 2000 sites and surface water connectivity to a Natura 2000 site.

Table 5-1 Bridge location relative to Natura 2000 sites and surface water connectivity.

Structure ID	Structure Name	River	WFD Sub-catchment	Within SAC	SAC Name	Within SPA	SPA Name	Hydrological link to SAC	Hydrological link to SPA
DL-N15-014.00	Drumrath Bridge/Laghey to Ballybofey Rd	Drumenny	Eske_SC_010	Yes	Lough Eske And Ardnamona Wood SAC (000163)	No	N/A	Within	Donegal Bay SPA ca. 3.2km d/s of bridge
DL-N56-001.00	River Eske Bridge	Eske 37	Eske_SC_010	Yes	Lough Eske And Ardnamona Wood SAC (000163)	No	N/A	Within	Donegal Bay SPA ca. 1.7km d/s of bridge
DL-N56-006.00	Eddrim Bridge	Donegal Bay	Eske_SC_010	Yes	Donegal Bay (Murvagh) SAC (000133)	Yes	Donegal Bay SPA (004151)	Within	Within
DL-N56-033.00	Gweebarra Bridge	Undefined	Gweebarra_SC_010	Yes	West of Ardara/Maas Road SAC (000197)	No	N/A	Within	No
DL-N56-046.00	Bedlam Bridge	Glenna	Tullaghobegly_SC_010	Yes	Ballyness Bay SAC (001090)	No	N/A	Within	Falcarragh to Meenlaragh SPA ca. 1.8km d/s of bridge
DL-N56-055.90	N56 Barnes Bridge	Undefined	Leannan_SC_020	No	N/A	No	N/A	Leannan River SAC ca. 3.2km d/s of bridge	Lough Fern SPA ca. 10.4km d/s of bridge
DL-N56-060.00	Milltown Bridge	Leannan	Leannan_SC_020	Yes	Leannan River SAC (2176)	No	N/A	Within	Lough Fern SPA ca. 3km d/s of bridge
GB-N06-006.00	Terryland River Bridge No.3	Terryland	Corrib_SC_010	No	N/A	No	N/A	Lough Corrib SAC ca. 1.2km d/s of bridge	Inner Galway Bay SPA ca 3.7km d/s of bridge
GC-N59-038.00	Letterfore Bridge	Undefined	BallycuirkeLoughStream_SC_010	Yes	Connemara Bog Complex SAC (002034)	No	N/A	Within	Lough Corrib SPA ca. 12.6km d/s of bridge

Structure ID	Structure Name	River	WFD Sub-catchment	Within SAC	SAC Name	Within SPA	SPA Name	Hydrological link to SAC	Hydrological link to SPA
GC-N63-015.00	Drinaun Bridge	non-listed	Suck_SC_050	No	N/A	No	N/A	No	River Suck Callows SPA ca. 3.2km d/s of bridge
GC-N63-019.00	Mount Talbort Bridge	Suck	Suck_SC_060	No	N/A	Yes	River Suck Callows SPA (004097)	No	Within
LM-N15-002.00	Banduff River Bridge	Duff	Duff_SC_010	Within 50m	Bunduff Lough And Machair/Trawalua/Mullaghmore SAC (000625)	No	N/A	Within 50m	No
LM-N16-012.00	Pollboy Bridge West	Shanvaus 35	Bonet_SC_010	Yes	Lough Gill SAC (001976)	No	N/A	Within	No
LM-N16-013.00	Pollboy Bridge East	Shanvaus 35	Bonet_SC_010	No	N/A	No	N/A	Lough Gill SAC ca. 0.2km d/s of bridge	No
LM-N16-018.00	Meenaphuill Bridge	Undefined	Drumcliff_SC_010	Yes	Ben Bulben, Gleniff and Glenade Complex SAC (000623)	No	N/A	Within	Drumcliff Bay SPA ca. 9.5km d/s of bridge
MO-N05-014.00	Little River Bridge	Little [Strade]	Moy_SC_070	No	N/A	No	N/A	River Moy SAC ca. 5.6km d/s of bridge	No
MO-N26-001.00	Rahans Bridge	Tullyegan 34	Moy_SC_100	No	N/A	No	N/A	River Moy SAC ca. 450m d/s of bridge	Killala Bay/Moy Estuary SPA ca. 4.5km d/s of bridge
MO-N26-003.00	Coolcronaun Bridge	Shanclough	Moy_SC_100	No	N/A	No	N/A	River Moy SAC ca. 1.3km d/s of bridge	Killala Bay/Moy Estuary SPA ca. 13.6km d/s of bridge
MO-N26-007.00	Carrick Bridge	Carrow Loughs (Stream)	Moy_SC_090	No	N/A	No	N/A	River Moy SAC ca. 2.4km d/s of bridge	No

Structure ID	Structure Name	River	WFD Sub-catchment	Within SAC	SAC Name	Within SPA	SPA Name	Hydrological link to SAC	Hydrological link to SPA
MO-N59-003.00	Knockadangan Bridge	Deel [Crossmolina]	Deel[Crossmolina]_SC_020		River Moy SAC (002298)	No	N/A	Within	Lough Conn and Lough Cullin SPA ca. 4.8km d/s of bridge
MO-N59-006.00	Coolturk Bridge	non-listed	Deel[Crossmolina]_SC_010	No	N/A	No	N/A	River Moy SAC ca. 3km d/s of bridge	No
MO-N59-008.00	Eskeragh Bridge	Fiddaunatooghaun	Deel[Crossmolina]_SC_010	Yes	Bellacorick Bog Complex SAC (001922)	No	N/A	Within	No
MO-N59-026.00	Lagduff Bridge	Undefined	Owenmore[Mayo]_SC_030	No	N/A	Yes	Owenduff/ Nephin Complex SPA (004098)	No	Within
MO-N59-042.00	Burrishoole Bridge	Undefined	Srahmore_SC_010	Yes	Clew Bay Complex SAC (1482)	No	N/A	Within	No
MO-N59-063.00	Gowlan Bridge	Undefined	Erriff_SC_010	Within 50m	Mweelrea/Sheeffry/ Erriff Complex SAC (001932)	No	N/A	Within 50m	No
MO-N59-066.00	Glenacally Bridge	32G04	Erriff_SC_010	Yes	Mweelrea/Sheeffry/ Erriff Complex SAC (001932)	No	N/A	Within	No
MO-N60-002.00	Manulla Bridge	Manulla 34	Castlebar_SC_020	Yes	River Moy SAC (002298)	No	N/A	Within	No
MO-N84-005.00	Keel Bridge	Aghinish 30	Aghinish_SC_010	Yes	Lough Carra/Mask Complex SAC (001774)	Yes	Lough Carra SPA (004051)	Within	Within

5.2. Description of the Special Areas of Conservation

5.2.1. Lough Eske and Ardnamona Wood SAC (000163)

Site Overview

"*This is a diverse site, most of which comprises a soft-water lake, Lough Eske, which occupies a large glacial-scoured hollow. Two rivers enter the lake, one from the north, one from the south-east. A third river, the R. Eske, is the lake outflow, situated in the south. A large area of old Oak (*Quercus *sp.) woodland, Ardnamona Wood, is found on the western side of the lake. Areas of freshwater marsh, fen, blanket bog, flush, heath, scrub and a variety of woodland and grassland types also occur within the site. The site is situated on a geological transition zone, being underlain by Dalradian schist and gneiss on the east and lower Carboniferous sandstone and limestone (predominantly the former) to the west and south.*

*This is a high quality site which includes a wide variety of habitats and species, several of which are rare in Ireland. The stand of old Oak woodland is a particularly fine example of this type of habitat and one that is generally rare in Ireland. The lake is a good example of the type and is notable for the stock of Arctic Charr (*Salvelinus alpinus*) that it holds. The site supports an important population of* Salmo salar*. A good example of poor intermediate fen vegetation occurs at the north end of the lake. The petrifying spring habitat is fairly restricted in area, though has at least two diagnostic bryophyte species. The site supports a good population of* Margaritifera, margaritifera*. The site holds many plant species that are rare in Ireland or in County Donegal, including* Trichomanes speciosum *and* Omalotheca sylvatica *which are legally protected.*"

Qualifying Interests

- Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]
- Petrifying springs with tufa formation (Cratoneurion) [7220]
- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]
- *Margaritifera* (Freshwater Pearl Mussel) [1029]
- *Salmo salar* (Salmon) [1106]
- *Trichomanes speciosum* (Killarney Fern) [1421]

5.2.2. Donegal Bay (Murvagh) SAC (000133)

Site Overview

"*This site comprises the extreme inner part of Donegal Bay. Several large rivers, notably the River Eske, enter the site. It is typically estuarine in character, with large expanses of intertidal sand and mud flats, channels, saltmarsh, sand dunes and sandy and shingle beaches. Several grassy islands occur in the site. The site provides habitat for a diversity of estuarine bird species, and the islands are used by* Anser albifrons flavirostris*. The area is underlain by limestone and shale bedrock from the carboniferous era.*

The site is a good example of a sheltered estuarine system, with extensive intertidal sand and mud flats mostly of good quality. The Murvagh peninsula still has some areas of fixed dunes and humid dune slacks, though these dune habitats are only of moderate quality. The population of Phoca vitulina *is one of the largest in the country. The site is of some importance for estuarine birds and is visited by* Anser albifrons flavirostris. Pyrola rotundifolia*, a Red Data Book species, is found on the site.*"

Qualifying Interests

- Mudflats and sandflats not covered by seawater at low tide [1140]
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]

- Dunes with *Salix repens* ssp. *argentea* (Salicion arenariae) [2170]
- Humid dune slacks [2190]
- *Phoca vitulina* (Harbour Seal) [1365]

5.2.3. West of Ardara/Maas Road SAC (000197)

Site Overview

"*The site comprises most of the peninsula situated west of the Ardara/Maas road, an area of blanket bog, lakes and heath to the east of this road, two large bays to the north and south of the peninsula, the lower section of the Gweebarra River and the island of Inishkeel situated 1km to the north of the peninsula. Much of the marine component of the site comprises shallow bays, estuaries, sand and sandflats. A large area of the site comprises a mosaic of blanket bog, heath, exposed rock, lakes and other wetlands, and humid grassland, but coastal habitats such as sand dunes, machair and salt marshes are well represented. Small areas of scrub and broad-leaved deciduous woodland are scattered throughout the site. Many of the coastal sections of the site are underlain by metamorphic rocks and limestone; most of the inland section of the site is underlain by intrusive igneous granodiorites.*

An exceptionally diverse, large site with a wide range of marine, coastal and inland habitats, many of which are of very high quality. The site holds several rare or scarce plant and animal species, including Najas flexilis *which has been recorded from two stations on the site,* Petalophyllum ralfsii*, populations of* Margaritifera margaritifera*,* Vertigo geyeri*,* Lutra lutra*,* Salmo salar*,* Phoca vitulina *and a large population of* Euphydryas aurinia*. The site is notable for the many important bird populations that occur, including nine species listed on Annex I of Council Directive 79/409/EEC.*"

Qualifying Interests

- Estuaries [1130]
- Mudflats and sandflats not covered by seawater at low tide [1140]
- Large shallow inlets and bays [1160]
- Annual vegetation of drift lines [1210]
- Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]
- Mediterranean salt meadows (Juncetalia maritimi) [1410]
- Embryonic shifting dunes [2110]
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]
- Decalcified fixed dunes with *Empetrum nigrum* [2140]
- Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150]
- Dunes with *Salix repens ssp. argentea* (Salicion arenariae) [2170]
- Humid dune slacks [2190]
- Machairs (* in Ireland) [21A0]
- Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]
- Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130]
- Northern Atlantic wet heaths with *Erica tetralix* [4010]
- European dry heaths [4030]
- Alpine and Boreal heaths [4060]

- *Juniperus communis* formations on heaths or calcareous grasslands [5130]
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]
- Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510]
- Blanket bogs (* if active bog) [7130]
- Depressions on peat substrates of the Rhynchosporion [7150]
- Alkaline fens [7230]
- *Vertigo geyeri* (Geyer's Whorl Snail) [1013]
- *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]
- *Euphydryas aurinia* (Marsh Fritillary) [1065]
- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]
- *Phoca vitulina* (Harbour Seal) [1365]
- *Petalophyllum ralfsii* (Petalwort) [1395]
- *Najas flexilis* (Slender Naiad) [1833]

5.2.4. Ballyness Bay SAC (001090)

Site Overview

"*The site is situated on the north-west coast of Donegal, near the towns of Falcarragh and Gortahork. The underlying rock is pelite, with some areas of limestone and quartzite. Site comprises a large, very sheltered, intertidal estuarine system which receives the flows of three small to medium sized rivers - the Tullaghobeg River, the Glenna River and the Owenawillin River. The outer part of the bay is marked by two substantial sand dune systems at Dooey and Drumnatinney. Other habitats present in small amounts include salt marsh, dry grassland, wet grassland and heath. Site is of high scenic value, and the dunes are a prominent feature of the Donegal coastline. Site is also of cultural importance, containing a number of listed national monuments.*

The site contains two important dune systems that are of moderate size and quality. The fixed dunes are of particular note and these occur in association with embryonic dunes, shifting white dunes and a limited area of humid dune slack. The dunes are highly dynamic, having been formed and maintained by a tidal pump action. Blown-over dunes are a feature as is the large area of unvegetated dune known as Big Dune. A good example of a very sheltered estuarine complex with extensive sand flats exposed at low tide. Some of the intertidal flats have a rich macroinvertebrate fauna, and Zostera *is present. The site supports significant numbers of waterfowl in autumn and winter, with nationally important concentrations of* Charadarius hiaticula *and* Calidris alba. Pluvialis apricaria *visit the site regularly but in small numbers. A population of the rare mollusc* Vertigo geyeri *has recently been recorded from a base-rich flush within the site.*"

Qualifying Interests

- Estuaries [1130]
- Mudflats and sandflats not covered by seawater at low tide [1140]
- Embryonic shifting dunes [2110]
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]
- Humid dune slacks [2190]

- *Vertigo geyeri* (Geyer's Whorl Snail) [1013]

5.2.5. Leannan River SAC (2176)

Site Overview

"*The site comprises the River Leannan and its main tributaries and lakes. The river from source to sea measures 46 km and drains a catchment area of 282 km. The Bullaba River drains off the Glendowan Mountains and flows into Lough Gartan. The Leannan River flows from Lough Gartan in a north-easterly direction, passes through Lough Fern, and then onwards in an easterly direction through the town of Rathmelton and into Lough Swilly. The main tributaries within the site are the lower Glashagh and Lurgy. Lough Gartan and the connected Lough Akibbon are oligotrophic lakes while Lough Fern is a mesotrophic or naturally eutrophic system. After leaving the higher ground in the vicinity of Gartan Lough, the River flows mostly through agricultural lands. Other habitats within the site include wet grassland, improved grassland, broad-leaved deciduous woodland, scrub, wet heath, and freshwater marsh.*

Gartan Lough and Lough Akibbon are excellent examples of oligotrophic lakes of sandy plains. The aquatic flora is diverse and includes an important population of the rare and legally protected Najas flexilis*, as well as scarce species such as* Pilularia globulifera*. Habitat quality is good. The site supports an important population of* Margaritifera margaritifera*, with over 1000 individuals estimated in 1995 and an age range from comparatively young to elderly (c.80+ years). The system is of importance for the conservation of* Salmo salar *and is notable as a good spring and grilse salmon river with extensive spawning habitats and good water quality.* Lutra lutra *is well distributed throughout. Lough Gartan has a population of* Salvelinus alpinus*. A number of Red Data Book plant species occur within the site, including* Trollius europaeus*,* Pseudorchis albida *and* Omalotheca sylvatica*. An important roost for* Nyctalus leisleri *occurs at Ramelton.* Gavia stellata*, an extremely rare breeding bird in Ireland, nests within the site.*"

Qualifying Interests

- Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]
- Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130]
- *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]
- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]
- *Najas flexilis* (Slender Naiad) [1833]

5.2.6. Connemara Bog Complex SAC (002034)

Site Overview

"*A vast area of lowland Atlantic blanket bog, providing one of the best examples of this habitat type in Ireland. The majority of land in the area is still quite intact and is of immense botanical and zoological interest. The underlying rock in the area is predominantly granite, with areas of gneiss and gabbro to the west of the site. There are numerous oligotrophic lakes throughout the site, with the Roundstone area providing an excellent example of a lake-studded blanket bog environment. Dystrophic pools are also encountered throughout the site, in association with other habitats including alkaline fens, quaking bog, transition mires, deciduous woodland, wet and dry heaths, scrub, semi-improved grassland, wet grassland and river habitats.*

The site is of exceptional scientific value, as it provides (with the exception of the Glenamoy Bog complex) the best example of a relatively unmodified lowland blanket bog habitat in Ireland. The primary interest of this site lies in the blanket bog and in the associated habitats of quaking bog, flushes, Rhynchosporion vegetation, dystrophic bog pools and fens. Excellent examples of lagoons occur, with highly diverse assemblages of flora and fauna. The site also

includes areas of reef. There are four Annex II species of flora and fauna, including Salmo salar*,* Najas flexilis *and* Lutra lutra*, and a total of 11 legally protected plant species. The site is of particular conservation importance for* Salmo salar *with excellent grilse and spring salmon rivers and lakes and extensive spawning habitat. The site has ornithological importance, with five Annex I Bird Directive species. The nesting* Falco columbarius *and* Pluvialis apricaria *within the site constitute a high proportion of the national totals for the species. Additional areas are included in the site under EU LIFE funded restoration projects.*"

Qualifying Interests

- Coastal lagoons [1150]
- Reefs [1170]
- Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]
- Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130]
- Natural dystrophic lakes and ponds [3160]
- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]
- Northern Atlantic wet heaths with *Erica tetralix* [4010]
- European dry heaths [4030]
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]
- Blanket bogs (* if active bog) [7130]
- Transition mires and quaking bogs [7140]
- Depressions on peat substrates of the Rhynchosporion [7150]
- Alkaline fens [7230]
- Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]
- *Euphydryas aurinia* (Marsh Fritillary) [1065]
- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]
- *Najas flexilis* (Slender Naiad) [1833]

5.2.7. Bunduff Lough and Machair/Trawalua/Mullaghmore SAC (000625)

Site Overview

"*This site is located on the south side of Donegal Bay and c.18 km north of Sligo town. The part of the site west of Mullaghmore Head is very exposed to prevailing wind and swells from the Atlantic, whereas the Head itself affords moderate shelter to the eastern part of the site. Bedrock is Middle Carboniferous limestone. The site is generally low-lying and includes a fine range of coastal habitats, with open shallow marine areas, intertidal sandy beaches, bedrock shoreline, various sand dune types, including fixed dunes and machair. Bunduff Lough is a shallow coastal lake, probably with a brackish influence, and is fringed with swamp, fen and dune grassland. Grazing is the main land use within the site and area is used for water-based recreational activities.*

This site is of importance in terms of both habitat diversity and quality. The machair and alkaline fen habitats are particularly well developed. Much of the machair is wet in character and there are interesting transitional areas with the alkaline fen. The machair is considered one of the best examples in the north-west region. A very substantial area of fixed dunes occurs, which are well-developed and mostly intact. Also present are well developed marram dunes and Juniper scrub. Intertidal sandflat, shallow bay and reef habitats are well represented, with a well-developed zonation of benthic communities and high species richness

in the littoral sediments. Petalophyllum ralfsii *has recently been found in the machair habitat. The site has a number of locally rare plant species, including* Orobanche rubra, Cuscuta epithymum, Epipactis palustris *and* Ophrys apifera. Cygnus cygnus *and* Pluvialis apricaria, *both Annex I Bird Directive species, are regular in winter.* Pyrrhocorax pyrrhocorax *breeds, as well as several wader species, notably* Vanellus vanellus *and small numbers of seabirds*."

Qualifying Interests

- Mudflats and sandflats not covered by seawater at low tide [1140]
- Large shallow inlets and bays [1160]
- Reefs [1170]
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]
- Humid dune slacks [2190]
- Machairs (* in Ireland) [21A0]
- *Juniperus communis* formations on heaths or calcareous grasslands [5130]
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]
- Alkaline fens [7230]
- *Euphydryas aurinia* (Marsh Fritillary) [1065]
- *Petalophyllum ralfsii* (Petalwort) [1395]

5.2.8. Lough Gill SAC (001976)

Site Overview

"*Lough Gill is a moderate to large sized lake lying immediately east of Sligo town. It is fed by the River Bonet and drains into the sea via the Garvogue River, a short, wide and slow flowing river which passes through Sligo town. The lake lies along the junction between old metamorphic rocks to the south and limestone to the north. The water of the lake is thus influenced by both acidic and alkaline inputs, although nearly all the basin lies over limestone. The lake is 8 km by 2-3 km and has an area of 1,400 ha. It is a deep lake, with maximum depth at 31 m. Islands are a feature of the lake. Much of the shoreline is wooded and there is also some swamp vegetation, wet grassland and scrub along the shoreline. The lake is an important salmonid and coarse fishery and is used for a range of recreational activities. The site also includes the Shanvans and Owenmore rivers.*

An important example of a lake which appears to be naturally eutrophic. Quality generally good though blooms of blue-green algae in recent years indicate some artificial enrichment. Significant areas of alluvial forest occur along the Garvoge River (Osmunda - Salicetum atrocinerea type) and at the mouth of the River Bonet (Carici remotae - Fraxientum type). Old oak woodland of varying quality is well scattered along the shoreline and on some of the islands and is an important example of this habitat for western Ireland. At least six Red Data Book plant species have been recorded from site. Site has three species of lamprey and Austropotamobius pallipes. *The lake and its associated rivers support an important population of* Salmo salar. Lutra lutra *has a good population within the site. Of minor importance for birds though the site has a small breeding colony of* Sterna hirundo. *A wide range of rare or scarce invertebrates are known from the site, as well as several Red Data Book mammal species, including* Martes martes."

Qualifying Interests

- Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150]
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]

- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]
- *Austropotamobius pallipes* (White-clawed Crayfish) [1092]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra planeri* (Brook Lamprey) [1096]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

5.2.9. Ben Bulben, Gleniff and Glenade Complex SAC (000623)

Site Overview

"*The site comprises a high plateau of carboniferous limestone capped by shale standing 300-650 metres above the surrounding country and sloping gently to the south-east. The edges of the plateau form steep, high cliffs, below which is found a skirt of scree. The cliffs and scree hold a rich diversity of arctic-alpine plants; the summit of the plateau is less diverse but does have extensive areas of blanket bog and heath, with rock outcropping frequently. A large number of streams drain the site, many of which form waterfalls. Glencar Lough, a medium-sized lake, is found on the southern side of the site. Wet and dry grassland, scrub, broad-leaved deciduous, flushes, swallow holes and small areas of fen and limestone pavement are also found on the site. Disused barytes workings occur above Gleniff valley.*

The site holds the finest examples of limestone cliffs in the country. These and the scree slopes below are home to extremely species-rich and diverse montane vascular plant, bryophyte and lichen floras, which include many Red Data Book species and species known only from this or one or two other sites in the country. The site holds a large number of pertifying springs, an extensive area of dry heath and a small area of alpine heath; much of the blanket bog on the site is eroding and of rather low quality. Several populations of the rare mollusc Vertigo geyeri *have recently been recorded from calcareous flushes within the site-these comprise the first records for Co. Leitrim. The occurrence of four pairs of* Falco peregrinus *breeding on the site is notable. The site is also utilised by* Lutra lutra*. The site has a little known but potentially interesting invertebrate fauna. The site is the type locality for the Ben Bulben shale, the Glencar limestone and the Dartry limestone.*"

Qualifying Interests

- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]
- Northern Atlantic wet heaths with *Erica tetralix* [4010]
- European dry heaths [4030]
- Alpine and Boreal heaths [4060]
- *Juniperus communis* formations on heaths or calcareous grasslands [5130]
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]
- Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230]
- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]
- Transition mires and quaking bogs [7140]
- Petrifying springs with tufa formation (Cratoneurion) [7220]
- Alkaline fens [7230]

- Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) [8110]
- Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) [8120]
- Calcareous rocky slopes with chasmophytic vegetation [8210]
- *Vertigo geyeri* (Geyer's Whorl Snail) [1013]
- *Lutra lutra* (Otter) [1355]

5.2.10. River Moy SAC (002298)

Site Overview

"*This site comprises almost the entire freshwater element of the Moy and its tributaries, including both Lough Conn and Lough Cullin. The system drains a catchment area of 805 km2. Most of the site is in Co. Mayo though parts are in west Sligo and north Roscommon. The underlying geology is Carboniferous Limestone for the most part though Carboniferous Sandstone is present at the extreme west of the site with Dalradian Quartzites and schists at the south west. The river and its various tributaries rise in a number of locations some of which are upland areas dominated by blanket bog and heath. Throughout most of its course however the river flows through low-lying countryside where most of the adjoining land consists of agricultural grassland. The river eventually reaches the sea at Ballina where it flows into Killala Bay. To the west of Lough Cullin the river passes through areas where the bedrock is dominated by silicious rocks such as granite and here the character of the adjoining land changes to one where blanket bog and heath are important components of the landscape. In addition to river and lake habitats, the site contains adjoining habitats of ecological interest such as raised bogs, heath, wet grassland and deciduous woodland. Small pockets of conifer plantations, close to the lakes and along parts of the rivers, are included. Improved grassland is also included where it occurs along the river channels.*

This extensive site contains good examples of the Annex 1 habitats active raised bog, degraded raised bog, Rhynchosporion vegetation, alkaline fen, alluvial woodland and old oak woodlands. The raised bog areas present constitute the most north-westerly examples of raised bog in Ireland, with the most important examples occurring at Derrynabrock and Tawnaghbeg. Alkaline fen is particularly well developed at Mannin and Island Lakes, an excellent example of old oak woodland is to be found just east of Pontoon along the shores of Loughs Conn and Cullin. This represents one of the largest stands of oak woodland in western Ireland. Water quality of the river channels is generally good and the majority is classified as unpolluted. The open waters of Loughs Conn and Cullin are moderately hard with relatively low colour and good transparency. Lough Conn, with a surface of 50km2, is classified as a mesotrophic system, while Lough Cullin (surface of 11 km2) is classified as an oligotrophic system. The rivers and lakes support important populations of Lutra lutra, Austropotamobius pallipes, Lampetra planeri *and* Petromyzon marinus. *The Moy system is one of the most important in Ireland for* Salmo salar *and is an internationally renowned fishery. It also has important stocks of* Salmo trutta. *Lough Conn supports a nationally important population of* Anser albifrons flavirostris *and has regionally important numbers of* Cygnus cygnus *and* Pluvialis apricaria *(all Annex I Bird Directive species). The lakes support a range of other wintering waterfowl, notably nationally important populations of* Aythya fuligula *and* Bucephala clangula. *Lough Conn / Cullin represents one of only 4 breeding sites in Ireland for* Melanitta nigra, *which in Ireland is at the south-west end of its European range. The population, however, has seriously declined in recent years. A range of mammals listed in the Red Data Book occur within the site, including* Martes martes *and* Myotis daubentoni. *At least five Red Data Book plant species occur, including* Cephalanthera longifolia *and Spiranthes romanzoffiana.*"

Qualifying Interests

- Active raised bogs [7110]
- Degraded raised bogs still capable of natural regeneration [7120]
- Depressions on peat substrates of the Rhynchosporion [7150]

- Alkaline fens [7230]
- Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]
- *Austropotamobius pallipes* (White-clawed Crayfish) [1092]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra planeri* (Brook Lamprey) [1096]
- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

5.2.11. Bellacorick Bog Complex SAC (001922)

Site Overview

"*A large expanse of lowland blanket bog, with numerous pools and dystrophic lakes, developed on gently undulating glacial drift overlying shales and sandstone and bordering carboniferous limestone to the east. Shallow stream valleys, bordered by humid grassland and heath vegetation, dissect the lowland plain. Site is notable for the widespread occurrence of flush and fen vegetation derived from mineral-rich and often calcareous groundwater seepage areas.*

Probably one of the largest and finest examples of intact lowland blanket bogs in Ireland, with exceptionally well developed pool complexes and dystrophic lakes. Rhynchosporion vegetation is well represented in many of the pool areas out in the wet, quaking bog area. Groundwater seepage areas are widespread and support a range of fen vegetation assemblages, including some of the best alkaline fens in the country, notable for their diversity of structure and species, especially rare boreal relict fen mosses such as Leiocolea rutheana, Homalothecium nitens *and* Paludella squarrosa. *One of only 4 locations for* Saxifroga hirculus, *an Annex II species. The site formerly supported wintering* Anser albifrons flavirostris. *Additional areas are included in the site under EU LIFE funded restoration projects.*"

Qualifying Interests

- Natural dystrophic lakes and ponds [3160]
- Northern Atlantic wet heaths with *Erica tetralix* [4010]
- Blanket bogs (* if active bog) [7130]
- Depressions on peat substrates of the Rhynchosporion [7150]
- Alkaline fens [7230]
- *Vertigo geyeri* (Geyer's Whorl Snail) [1013]
- *Saxifraga hirculus* (Marsh Saxifrage) [1528]

5.2.12. Owenduff/Nephin Complex SAC (000534)

Site Overview

"*This is a large inland site which is underlain by schists and gneisses in the west and quartzite in the east and south. A large proportion of the site (c.25%) lies above 200 m and these upland areas contain spectacular mountain cliffs and corrie lakes. Many of the mountain peaks reach altitudes of over 500 metres, while 721 metres is the height of the tallest summit. Most of the site is drained by the Owenduff River and its complex network of tributaries and streams, which generally flow in a south-east to north-west direction. Much of the land surrounding the site is afforested with conifers.*

Extensive tracts of deep blanket bog dominate most of this site. It occurs both on gently undulating terrain and mountain slopes and is rated as of International Importance. Other Annex I habitats occurring within the site are dystrophic lakes, transition mires, oligotrophic lakes, Juniper scrub, wet heath, alpine heath and floating river vegetation. In addition to blanket bog of international importance, the Owenduff River, which drains most of the site, is one of the best examples of a little-modified river system in Western Europe. The site contains the EU Habitats Directive Annex II plant species Saxifraga hirculus *and* Drepanocladus vernicosus*, and the Annex II animals* Lutra lutra *and* Salmo salar*. Four Annex I Bird Directive species occur, all typical bogland and upland species:* Anser albifrons flavirostris*,* Falco peregrinus*,* Falco columbarius *and* Pluvialis apricaria."

Qualifying Interests

- Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]
- Natural dystrophic lakes and ponds [3160]
- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]
- Northern Atlantic wet heaths with *Erica tetralix* [4010]
- Alpine and Boreal heaths [4060]
- *Juniperus communis* formations on heaths or calcareous grasslands [5130]
- Blanket bogs (* if active bog) [7130]
- Transition mires and quaking bogs [7140]
- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]
- *Drepanocladus vernicosus* (Slender Green Feather-moss) [1393]
- *Saxifraga hirculus* (Marsh Saxifrage) [1528]

5.2.13. Clew Bay Complex SAC (001482)

Site Overview

"*Clew Bay is a wide, west facing, bay on the west coast. It is open to the Atlantic westerly swells and winds, with Clare Island giving only a small amount of protection. Geomorphologically, the bay is a classic example of a drowned drumlin landscape, with numerous small islands which have been created since the last glacial period. The geomorphology of the bay has also resulted in a complex series of interlocking bays creating a wide variety of marine and terrestrial habitats. The shores of the drumlin islands and the inner part of the bay are a mixture of boulders, cobbles, pebbles and gravel, but there are extensive areas of intertidal sand and mud flats. Lough Furnace, a large, deep, stratified saline lake lagoon, is included in the site, along with some of the surrounding area of bog and heath.*

The geomorphological structure of this bay is unique in Ireland. This site is important as it has a good range of representative shallow bay communities reflecting the range of sediment types from boulders and cobbles on mixed sediment to mud and maerl beds. A number of marine species were recorded from this bay that were not recorded at any other site during the BioMar survey. The site includes a large area of tidal mud/sand flats. Clew Bay has the most significant shingle reserves in the country, and has the only examples of incipient gravel barriers in Ireland. Associated with the shingle (and dunes) are excellent examples of annual vegetation of drift lines. Atlantic salt meadows are very well represented throughout the site and two dune systems also occur. Lough Furnace is a good example (and one of the largest in the country) of a deep, stratified saline lake lagoon in a natural state, of which there are very few in Ireland. A fine stand of old oak woodland occurs within the site near Newport. The legally protected plant Hammarbya paludosa *occurs within site and there is a large population of* Erica erigena *around Lough Furnace. The site has important resident populations of* Lutra lutra *and* Phoca vitulina*. The site also includes a population of* Vertigo geyeri*. The relict mysid* Neomysis

integer *occurs in Lough Furance. Clew Bay is a traditional breeding site for* Sterna hirundo, Sterna paradisaea *and* Sterna albifrons*, and has a breeding colony of* Phalacrocorax carbo. *The bay supports a range of wintering waterfowl, with nationally important populations of* Branta leucopsis, Mergus merganser *and* Charadrius hiaticula."

Qualifying Interests

- Mudflats and sandflats not covered by seawater at low tide [1140]
- Coastal lagoons [1150]
- Large shallow inlets and bays [1160]
- Annual vegetation of drift lines [1210]
- Perennial vegetation of stony banks [1220]
- Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]
- Embryonic shifting dunes [2110]
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
- Machairs (* in Ireland) [21A0]
- Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]
- *Vertigo geyeri* (Geyer's Whorl Snail) [1013]
- *Lutra lutra* (Otter) [1355]
- *Phoca vitulina* (Harbour Seal) [1365]

5.2.14. Mweelrea/Sheeffry/Erriff Complex SAC (001932)

Site Overview

"*The geology of the site is dominated by sandstones, shales and slates of Ordovician and Silurian age. Steep-sided mountains dominate most of the site and the tallest of these is Mweelrea which reaches an altitude of 814 m. Lowland blanket bog over flat ground occurs in patches along the northern and eastern sides of the site. Particularly fine examples of corrie lakes occur in this site. The site is drained by a number of well-developed base poor river systems, e.g. the Erriff, the Glenummera and the Bundorragh. Some of the blanket bog adjacent to the site has been planted with coniferous trees.*

This is a large upland site of great scenic value which also contains a particularly good area of coastal habitat along its westernmost boundary. The upland areas contain extensive areas of blanket bog, heath, grassland, cliff, lake and river habitats. Blanket bog is also well developed in the lowland areas and here depressions on peat substrates (Rhynchosporion) is well represented. Some of the bog, heath and grassland habitats are suffering from overgrazing at present. The coastal area of Dooaghtry contains a range of different coastal habitats in a relatively small area - these include sand-dune, machair, lagoon, calcareous fen, heath and woodland. Overall, the site has an outstandingly high number of habitats which are listed on Annex I of the Habitats Directive. In addition, there are seven Annex II species of flora and fauna and four Annex I Bird Directive species."

Qualifying Interests

- Coastal lagoons [1150]
- Annual vegetation of drift lines [1210]
- Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]
- Mediterranean salt meadows (Juncetalia maritimi) [1410]
- Embryonic shifting dunes [2110]
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]

- Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150]
- Dunes with *Salix repens ssp. argentea* (Salicion arenariae) [2170]
- Machairs (* in Ireland) [21A0]
- Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]
- Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130]
- Natural dystrophic lakes and ponds [3160]
- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]
- Northern Atlantic wet heaths with *Erica tetralix* [4010]
- European dry heaths [4030]
- Alpine and Boreal heaths [4060]
- *Juniperus communis* formations on heaths or calcareous grasslands [5130]
- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]
- Blanket bogs (* if active bog) [7130]
- Transition mires and quaking bogs [7140]
- Depressions on peat substrates of the Rhynchosporion [7150]
- Petrifying springs with tufa formation (Cratoneurion) [7220]
- Alkaline fens [7230]
- Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) [8110]
- Calcareous rocky slopes with chasmophytic vegetation [8210]
- Siliceous rocky slopes with chasmophytic vegetation [8220]
- *Vertigo geyeri* (Geyer's Whorl Snail) [1013]
- *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014]
- *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]
- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]
- *Petalophyllum ralfsii* (Petalwort) [1395]
- *Najas flexilis* (Slender Naiad) [1833]

5.2.15. Lough Carra/Mask Complex SAC (001774)

Site Overview

> "*General geological character of the area is carboniferous limestones, with some shales and sandstones. Lough Mask dominates the site being the sixth largest lake in Ireland and one of the deepest (maximum depth 58m). The eastern side of Mask is edged by a mosaic of limestone pavement, scrub and woodland. The paving floods. In contrast, the western shore is backed by high mountains from which the fast flowing Owenbrin river flows, and where it enters the lake it forms an extensive delta of coarse sandy sediment. Lough Carra is generally shallow (maximum depth 9m) and surrounded by limestone pavement with a diversity of other habitats, both limestone related and wetland type. A feature of the lakes are the many islands. Loughs Mask and Carra are hydrologically linked, while the main outflowing river in Mask connects to Lough Corrib.*

This site is of immense importance for the occurrence of scarce and specialised habitats, as well as animal and plant species. Lough Carra is one of the best examples of a marl lake in the country, while Mask is one of the largest lowland oligotrophic systems. The site is the northern limit of the western limestones. The limestone pavement, which is one of the most important examples outside of the Burren, occurs in mosaic with good examples of dry heath and calcareous grassland rich in orchids. Alkaline fens and calcareous fens with Cladium mariscus are a feature of the marginal wetland vegetation and both are well represented. Alluvial forest is well-developed at Lough Mask, especially at Ballykine and Clonbur. Taxus baccata occurs as a component of the woodland at Clonbur. An internationally important population of Rhinolophus hipposideros, which is at the northern limit of the species' distribution in Ireland, is also present. A population of Drepanocladus vernicosus *on the shoreline of Lough Mask is the only known example of a lake-shore population in Ireland. Several Red Data Book plant species occur. Also supports* Lutra lutra*, the glacial relict* Salvelinus alpinus*, and a rare shrimp* Niphargus *spp. Important for wintering and breeding birds, with* Anser albifrons flavirostris*,* Sterna hirundo *and* Larus *gulls.*"

Qualifying Interests

- Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]
- Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130]
- Hard oligo-mesotrophic waters with benthic vegetation of *Chara spp.* [3140]
- European dry heaths [4030]
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]
- Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210]
- Alkaline fens [7230]
- Limestone pavements [8240]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]
- *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]
- *Lutra lutra* (Otter) [1355]
- *Drepanocladus vernicosus* (Slender Green Feather-moss) [1393]

5.3. Description of the Special Protection Areas

5.3.1. Donegal Bay SPA (004151)

Site Overview

"*The Donegal Bay SPA is a very large, marine dominated, site. It extends from Doorin Point, to the west of Donegal town, to Tullaghan Point in Co. Leitrim, a distance of approximately 15 km along its north-east/south-west axis. It varies in width from about 3 km to over 8 km. The site includes the estuary of the River Eske, which flows through Donegal town, and the estuary of the River Erne which flows through Ballyshannon. Much of the shoreline is rocky or stony, with well-developed littoral reefs in places. There are also extensive stretches of sandy beach, especially from the Murvagh peninsula southwards to Rossowlagh and at the outer part of the Erne estuary. Shingle or cobble beaches are also represented. There are extensive areas of intertidal flats associated with the Eske Estuary, reflecting the very sheltered conditions in this part of the bay. These have been shown to be biotope rich. Elsewhere a narrow fringe of intertidal flats is exposed at low tides. Salt marshes are found in the sheltered conditions of the innermost part of the bay. A number of small, grassy, islands occur in the innermost part of the bay. The shallow bay waters overlie mostly sandy substrates though reefs occur in places.*

This site supports an excellent diversity of waterfowl species associated with shallow bays. It has an internationally important wintering population of Gavia immer *and is one of the top sites in the country for this species. Also has one of the few regular populations of* Gavia arctica *in the country and a regionally important population of* Gavia stellata. *The site has nationally important populations of* Melanitta nigra *(up to 4.6% of all-Ireland total) and* Branta bernicla hrota. *A range of other species associated with estuarine and shoreline habitats occur. The site provides both feeding and roost sites for most of the species. Habitat quality is mostly good. The site has a population of* Phoca vitulina."

Qualifying Interests

- Great Northern Diver (*Gavia immer*) [A003]
- Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]
- Common Scoter (*Melanitta nigra*) [A065]
- Sanderling (*Calidris alba*) [A144]
- Wetland and Waterbirds [A999]

5.3.2. Falcarragh to Meenlaragh SPA (004149)

Site Overview

"*Falcarragh to Meenlaragh SPA is located on the eastern and western sides of Ballyness Bay on the north-west coast of Co. Donegal. This large site follows the coastline from Falcarragh to Meenlaragh and encompasses three areas of mixed agricultural grassland.*

Falcarragh to Meenlaragh SPA supports a nationally important breeding population of Crex crex *and is one of a suite of sites along the western seaboard that is regularly utilised by this species. Crex crex is listed on the 2010 International Union for Conservation of Nature (IUCN) Red List of Threatened Species. This is due to population and range declines of more than 50% in the last 25 years across significant parts of its range.*"

Qualifying Interest

- Corncrake (*Crex crex*) [A122]

5.3.3. Lough Fern SPA (004060)

Site Overview

"*Lough Fern is a relatively small lake with a maximum length of 2.5 km. The lake lies on the Leannan River and is underlain by metamorphic rock (schist, gneiss, quartzite). It is a shallow system, with a maximum depth of 2.5 m. The water is soft though not markedly coloured. It is classified as mesotrophic (sampled in 2000). The shoreline is often stony though swamp vegetation occurs in the northern and southern parts. There are two small islands within the lake, both covered with deciduous woodland.*

The site is of importance mainly for the high numbers of diving duck that it supports. The Aythya ferina *population is of national importance, with substantial numbers of* Aythya fuligula*. It supports a range of other species though in relatively low numbers, including* Cygnus cygnus*,* Fulica atra *and some dabbling duck. Numbers of birds fluctuate a lot, probably reflecting the relatively small size of the lake. More rigorous monitoring of bird populations is required. The site supports the Red Data Book plant* Trollius europaeus*. The Leannan is an important salmonid system."*

Qualifying Interests

- Pochard (*Aythya ferina*) [A059]
- Wetland and Waterbirds [A999]

5.3.4. Inner Galway Bay (004031)

Site Overview

"*Galway Bay SPA is a very large, marine-dominated, site situated on the west coast of Ireland. The inner bay is protected from exposure to Atlantic swells by the Aran Islands and Black Head. Subsidiary bays and inlets (e.g. Poulnaclough, Aughinish and Kinvarra Bays) add texture to the patterns of water movement and sediment deposition, which lends variety to the marine habitats and communities. The terraced Carboniferous (Viséan) limestone platform of the Burren sweeps down to the shore and into the sublittoral. The long shoreline is noted for its diversity, with complex mixtures of bedrock shore, shingle beach, sandy beach and fringing salt marshes. Intertidal sand and mud flats occur around much of the shoreline, with the largest areas being found on the sheltered eastern coast between Oranmore Bay and Kinvarra Bay. Seagrass beds lie off Finavarra Point. A number of small islands composed of glacial deposits are included, such as Deer Island, along with some rocky islets.*

Galway Bay is one of the most important ornithological sites in the western region. It supports internationally important wintering populations of Gavia immer *and* Branta bernicla hrota *and regularly occurring nationally important populations of an additional 16 species, most notably* Mergus serrator *(6.7% of national total),* Charadrius hiaticula *(3.3% of total),* Anas clypeata *(2.9% of total) and* Limosa lapponica *(2.5% of total). It supports the largest and the most regular population of* Gavia arctica *in the country. The bay is an important wintering site for gulls, and is of national significance for at least* Larus canus*. Breeding birds of note are* Phalacrocorax carbo*,* Sterna sandvicensis *and* Sterna hirundo*. The site provides both feeding and roost sites for most of the species, though some birds commute to areas outside of the site. The birds of Galway Bay have been monitored annually since 1980/81. The site has one of the largest populations of* Phoca vitulina *in the country.*"

Qualifying Interests

- Great Northern Diver (*Gavia immer*) [A003]
- Cormorant (*Phalacrocorax carbo*) [A017]
- Grey Heron (*Ardea cinerea*) [A028]
- Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]
- Wigeon (*Anas penelope*) [A050]

- Teal (*Anas crecca*) [A052]
- Shoveler (*Anas clypeata*) [A056]
- Red-breasted Merganser (*Mergus serrator*) [A069]
- Ringed Plover (*Charadrius hiaticula*) [A137]
- Golden Plover (*Pluvialis apricaria*) [A140]
- Lapwing (*Vanellus vanellus*) [A142]
- Dunlin (*Calidris alpina*) [A149]
- Bar-tailed Godwit (*Limosa lapponica*) [A157]
- Curlew (*Numenius arquata*) [A160]
- Redshank (*Tringa totanus*) [A162]
- Turnstone (*Arenaria interpres*) [A169]
- Black-headed Gull (*Chroicocephalus ridibundus*) [A179]
- Common Gull (*Larus canus*) [A182]
- Sandwich Tern (*Sterna sandvicensis*) [A191]
- Common Tern (*Sterna hirundo*) [A193]
- Wetland and Waterbirds [A999]

5.3.5. Lough Corrib SPA (004042)

Site Overview

"*Lough Corrib is the largest lake in the Republic of Ireland. The lake can be divided into two parts: a relatively shallow basin, underlain by Carboniferous limestone, in the south and a larger, deeper basin, underlain by more acidic granite, schists, shales and sandstones, to the north. The main inflowing rivers are the Black, Clare, Dooghta, Cregg, Owenriff and the channel from Lough Mask. The main outflowing river is the Corrib, which reaches the sea at Galway City. Lough Corrib is classified as a mesotrophic system and overall water quality is considered to be satisfactory. The shallow, lime-rich waters of the southern basin of the lake support one of the most extensive beds of charophytes (Chara spp.) in Ireland, which occur mixed with submerged pondweeds (*Potamogeton *spp.). Large areas of reedswamp vegetation, dominated by varying mixtures of* Phragmites australis *and* Scirpus lacustris*, occur around the margins of the lake. Reedswamp usually grades into species-rich marsh vegetation. Of particular note are the extensive beds of* Cladium mariscus *that have developed over the marly peat deposits in sheltered bays. The lake has numerous islands, from rocky islets to larger islands with grassland or woodland. The surrounding lands are mostly pastoral farmland, to the south and east, and bog and heath, to the west and north. Lough Corrib is an internationally renowned salmonid fishery.*

The site is of international importance for wintering Aythya ferina *but also qualifies for international importance because it regularly supports well in excess of 20,000 waterfowl. It is one of the top five sites in the country for wintering waterfowl. Of particular importance is that it is the most important site in the country for* Aythya ferina*,* Aythya fuligula *and* Fulica atra *supporting 21%, 46% and 13% of the respective national totals. It also has nationally important populations of wintering* Cygnus olor*,* Anas strepera*,* Anas clypeata*,* Pluvialis apricaria *and* Vanellus vanellus*. The lake is a traditional site for* Anser albifrons flavirostris*. Small numbers of* Cygnus cygnus *winter. Lough Corrib is a traditional breeding site for gulls and terns. There are nationally important colonies of* Sterna hirundo *and* Sterna paradisaea*, as well as* Larus ridibundus *and* Larus canus*. Considerable higher numbers of gulls bred in the 1970s and 1980s. Whilst only colonised in the 1970s/80s by nesting* Melanitta nigra*, Lough Corrib now supports approximately half of the national population of this rare duck, which is a Red Data Book species. The population has been stable since the mid-1990s. Lough Corrib supports a*

range of species listed on Annex II of the E.U. Habitats Directive, including Lutra lutra, Salmo salar *and* Najas flexilis."

Qualifying Interests

- Gadwall (*Anas strepera*) [A051]
- Shoveler (*Anas clypeata*) [A056]
- Pochard (*Aythya ferina*) [A059]
- Tufted Duck (*Aythya fuligula*) [A061]
- Common Scoter (*Melanitta nigra*) [A065]
- Hen Harrier (*Circus cyaneus*) [A082]
- Coot (*Fulica atra*) [A125]
- Golden Plover (*Pluvialis apricaria*) [A140]
- Black-headed Gull (*Chroicocephalus ridibundus*) [A179]
- Common Gull (*Larus canus*) [A182]
- Common Tern (*Sterna hirundo*) [A193]
- Arctic Tern (*Sterna paradisaea*) [A194]
- Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]
- Wetland and Waterbirds [A999]

5.3.6. River Suck Callows SPA (004097)

Site Overview

"*The River Suck is the largest tributary of the River Shannon. The site follows the river from Castlecoote, near Fuerty to its confluence with the River Shannon, a distance of approximately 70 km of river course. The main habitat is grassland, improved to varying extents, that is seasonally flooded. The less improved areas are species-rich. The grassland is used mainly for pasture but some is used for silage or occasionally hay-making. The river channel is fringed in places by swamp and marsh vegetation. The site adjoins several raised bogs and cutover bogs and there are turloughs in the vicinity.*

The River Suck Callows is an important site for wintering waterfowl, with an internationally important population of Anser albifrons flavirostris *centred within the site. This is one of the largest flocks in the country outside of the Wexford Slobs. Despite poor survey data for recent years, it is known that at least three species have populations of national importance:* Cygnus cygnus, Anas penelope *and* Vanellus vanellus. Cygnus columbarius bewickii *formerly occurred in significant numbers but has abandoned the site, in line with a marked contraction of range at a national level.* Crex crex *formerly bred but not since the early 1990s. This site provides one of the few remaining examples in the country of a large river system of which parts still flood in a fairly natural way.*"

Qualifying Interests

- Whooper Swan (*Cygnus cygnus*) [A038]
- Wigeon (*Anas penelope*) [A050]
- Golden Plover (*Pluvialis apricaria*) [A140]
- Lapwing (*Vanellus vanellus*) [A142]
- Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]
- Wetland and Waterbirds [A999]

5.3.7. Drumcliff Bay SPA (004013)

Site Overview

"*Drumcliff Bay is the most northerly sector of Sligo Bay's three estuarine inlets. It extends from the village of Drumcliff as far west as Raghly Point, a distance of over 9 km. The innermost part of the site is well sheltered and at low tide extensive intertidal flats are exposed. The flats support* Zostera noltii*. The outer part of the site is shallow marine water. Sandy beaches are well represented, along with some salt marsh and stony shoreline. The site includes goose-feeding fields of improved grassland at Ballygilgan and Ballintemple. Some mixed woodland is also included.*

Drumcliff Bay SPA is of importance for the diversity of wintering waterfowl and is an integral part of the larger unit of Sligo Bay. Its principal importance, however, is that it supports an internationally important population of Branta leucopsis*, which is one of the two most important flocks in the country (ca. 21% of the national total). It also supports nationally important populations of Calidris alba (4.0% of the national total) and populations of* Clangula hyemalis *and* Limosa lapponica *that are close to national importance, as well as a population of* Cygnus cygnus *of local/regional importance. More intensive survey may show that higher numbers of some species occur. Drumcliff Bay has a population of* Phoca vitulina*."*

Qualifying Interests

- Sanderling (*Calidris alba*) [A144]
- Bar-tailed Godwit (*Limosa lapponica*) [A157]
- Wetland and Waterbirds [A999]

5.3.8. Killala Bay/Moy Estuary SPA (004036)

Site Overview

"*This large site comprises the inner, estuarine part of Killala Bay, at the mouth of the River Moy. It is a funnel-shaped estuary that is approximately 7 km wide at its outer limit. The site is well-sheltered by a sandy island, Bartragh Island, that extends across much of the outer part, and by a sandy peninsula which extends from Enniscrone on the eastern side. Extensive intertidal sand and mud flats are exposed at low tide. Salt marshes skirt part of the intertidal flats.*

This site is a fine example of an estuarine system in a natural state. It supports an excellent diversity of wintering waterfowl and is one of the most important sites in the region. Six of the species have populations of national importance: Limosa lapponica*,* Charadrius hiaticula*,* Pluvialis squatarola*,* Calidris alba*,* Calidris canutus *and* Calidris alpina*.* Pluvialis apricaria *also occurs in numbers close to national importance. There is a regular population of* Branta bernicla hrota *which in some winters exceeds the threshold for international importance.* Gavia stellata *is regular within the site. The Red Data Book species* Groenlandia densa *occurs in the site.*"

Qualifying Interests

- Ringed Plover (*Charadrius hiaticula*) [A137]
- Golden Plover (*Pluvialis apricaria*) [A140]
- Grey Plover (*Pluvialis squatarola*) [A141]
- Sanderling (*Calidris alba*) [A144]
- Dunlin (*Calidris alpina*) [A149]
- Bar-tailed Godwit (*Limosa lapponica*) [A157]
- Curlew (*Numenius arquata*) [A160]

- Redshank (*Tringa totanus*) [A162]
- Wetland and Waterbirds [A999]

5.3.9. Lough Conn and Lough Cullin SPA (004228)

Site Overview

"*Lough Conn and Lough Cullin are situated in north Co. Mayo and are connected by a narrow inlet near Pontoon. The main inflowing rivers to Lough Conn are the Deel, the Addergoole and the Castlehill while the main outflowing river from Lough Cullin is the River Moy. The lakes have a number of small islands. Fringing swamp vegetation occurs in some sheltered areas. Both Lough Conn and Lough Cullin are part of an important salmonid fishery.*

Lough Conn and Lough Cullin is one of only four breeding sites in the country for Melanitta nigra *(supporting 40% of the all-Ireland total), a species that in Ireland is at the south-west end of its European range. Recent surveys have recorded a considerably reduction in breeding pairs. Lough Conn and Lough Cullin is also of importance for wintering waterfowl, with a nationally important population of* Aythya fuligula *(1% of all-Ireland total). The lakes attract other species in lesser numbers, including* Cygnus olor, Cygnus, Anas crecca, Pluvialis squatarola, Bucephala clangula, Vanellus vanellus *and* Podiceps cristatus. *Lough Conn is also one of the sites utilised by a population of* Anser albifrons flavirostris. *The geese feed mainly on Annagh Island and at a shoreline site near Cloonaghmore Point.*"

Qualifying Interests

- Tufted Duck (*Aythya fuligula*) [A061]
- Common Scoter (*Melanitta nigra*) [A065]
- Common Gull (*Larus canus*) [A182]
- Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]
- Wetland and Waterbirds [A999]

5.4. Conservation Objectives

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. 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.

Conservation objectives for SACs and SPAs are required to be set for the habitats and species for which the site has been designated. Detailed site-specific conservation objectives have been set for the majority of SACs and SPAs, which can be found within the Conservation Objectives document for each site on the NPWS website. Generic conservation objectives have been compiled for the remaining SACs and SPAs.

The overall aim of conservation objectives is for the maintenance or restoration of the favourable conservation conditions of the Annex I habitats and/ or Annex II species for which the SAC has been selected, under which the site-specific objectives contain more detailed attributes, measures and targets.

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 of its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when: -

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

The conservation objectives of SPAs are also to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for SPAs, which are defined by the following list of attributes and targets: -

- Population trend: Measure or percentage change and whether the long-term population trend is stable or increasing.
- Distribution: Number, range, timing and intensity of use of areas. There is to be no significant decrease in the range, timing or intensity of use of areas by bird species, other than that occurring from natural patterns of variation.

The conservation objective for non-breeding birds of Special Conservation Interests of SPAs are as follows: -

- To maintain the favourable conservation condition of the non-breeding waterbird Special Conservation Interest species listed for a SPA.
- To maintain the favourable conservation condition of the wetland habitat for a SPA as a resource for the regularly occurring migratory waterbirds that utilise it.

The conservation objectives for SACs and SPAs were considered during the preparation of this report.

5.5. Qualifying Interests

Table 5-2 summarises the SAC qualifying interests and Table 5-3 the SPA qualifying interests within the potential zone of influence of the proposed project.

Appendix A lists the bridges that fall within the potential zone of influence of each SAC and SPA and lists the qualifying interests of each Natura 2000 site.

Table 5-2 SAC Qualifying Interests.

SAC Qualifying Interests.
Species
1013 Geyer's Whorl Snail (*Vertigo geyeri)*
1014 Narrow-mouthed Whorl Snail *(Vertigo angustior)*
1029 Freshwater Pearl Mussel *(Margaritifera margaritifera)*
1065 Marsh fritillary *(Euphydryas aurinia)*
1092 White-clawed crayfish *(Austropotamobius pallipes)*
1095 Sea lamprey *(Petromyzon marinus)*
1096 Brook lamprey *(Lampetra planeri)*
1099 River lamprey *(Lampetra fluviatilis)*
1106 Salmon *(Salmo salar)*
1303 Lesser horseshoe bat *(Rhinolophus hipposideros)*
1355 Otter *(Lutra lutra)*
1365 Harbour sea *(Phoca vitulina)*
1395 Petalwort *(Petalophyllum ralfsii)*
1421 Killarney fern *(Trichomanes speciosum)*
1528 Yellow Marsh Saxifrage *(Saxifraga hirculus)*
1833 Slender Naiad *(Najas flexilis)*
6216 Slender Green Feather Moss (*Hamatocaulis vernicosus)*
Habitats
1130 Estuaries
1140 Mudflats and sandflats not covered by seawater at low tide
1150 * Coastal lagoons
1160 Large shallow inlets and bays
1170 Reefs
1210 Annual vegetation of drift lines
1220 Perennial vegetation of stony banks
1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
1410 Mediterranean salt meadows (Juncetalia maritimi)
2110 Embryonic shifting dunes
2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes

SAC Qualifying Interests.
2130 * Fixed coastal dunes with herbaceous vegetation (grey dunes)
2140 Decalcified fixed dunes with *Empetrum nigrum*
2150 Atlantic decalcified fixed dunes (Calluno-Ulicetea)
2170 Dunes *with Salix repens ssp. argentea* (Salicion arenariae)
2190 Humid dune slacks
3110 Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)
3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea
3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.
3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation
3160 Natural dystrophic lakes and ponds
3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation
4010 Northern Atlantic wet heaths with *Erica tetralix*
4030 European dry heaths
4060 Alpine and Boreal heaths
5130 *Juniperus communis* formations on heaths or calcareous grasslands
6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates *(Festuco-Brometalia) (* important orchid sites)*
6230 * Species-rich *Nardus* grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)
6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
6510 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)
7110 Active raised bogs
7120 Degraded raised bogs still capable of natural regeneration
7130 Blanket bogs (* if active bog)
7140 Transition mires and quaking bogs
7150 Depressions on peat substrates of *the Rhynchosporion*
7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*
7220 * Petrifying springs with tufa formation (Cratoneurion)
7230 Alkaline fens
8110 Siliceous scree of the montane to snow levels *(Androsacetalia alpinae* and *Galeopsietalia ladani)*
8210 Calcareous rocky slopes with chasmophytic vegetation
8220 Siliceous rocky slopes with chasmophytic vegetation
8240 Limestone pavements
21A0 Machairs (* in Ireland)
91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

SAC Qualifying Interests.
91E0 * Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)*
91D0 Bog woodland

Note: - * denotes priority annex habitats.

Table 4-3 SPA Qualifying Interests.

SPA Qualifying Interests.
Code / Species
A003 Great Northern Diver (*Gavia immer)*
A017 Cormorant (*Phalacrocorax carbo)*
A028 Grey Heron (*Ardea cinerea)*
A038 Whooper Swan (*Cygnus cygnus)*
A046 Light-bellied Brent Goose (*Branta bernicla hrota)*
A050 Wigeon (*Anas penelope)*
A052 Teal (*Anas crecca)*
A056 Shoveler (*Anas clypeata)*
A061 Tufted Duck (*Aythya fuligula)*
A065 Common Scoter (*Melanitta nigra)*
A069 Red-breasted Merganser *(Mergus serrator)*
A098 Merlin (*Falco columbarius)*
A122 Corncrake *(Crex crex)*
A137 Ringed Plover *(Charadrius hiaticula)*
A140 Golden Plover (*Pluvialis apricaria)*
A141 Grey Plover (*Pluvialis squatarola)*
A142 Lapwing (*Vanellus vanellus)*
A144 Sanderling *(Calidris alba)*
A149 Dunlin *(Calidris alpine)*
A157 Bar-tailed Godwit *(Limosa lapponica)*
A160 Curlew (*Numenius arquata)*
A162 Redshank (*Tringa tetanus)*
A169 Turnstone (*Arenaria interpres)*
A179 Black-headed Gull (*Chroicocephalus ridibundus)*
A182 Common Gull (*Larus canus)*
A191 Sandwich Tern (*Sterna sandvicensis)*
A193 Common Tern (*Sterna hirundo)*
A395 Greenland White-fronted Goose (*Anser albifrons flavirostris)*
Habitats
Wetland and Waterbirds [A999]

5.6. Likelihood of Potential Impacts on Natura 2000 sites

The available information on Natura 2000 sites was reviewed to establish whether or not the proposed works have the potential to have an adverse effect on the integrity of the designated sites. The likelihood of impacts on the qualifying interests of the Natura 2000 sites identified in this report is based on information collated from the desk study, GIS database, bridge photos, work orders and other available existing information.

The likelihood of impacts occurring are established in light of the type and scale of the proposed works, the location of the proposed works with respect to Natura 2000 sites and the features of interest and conservation objectives of the Natura 2000 sites.

This NIS report is prepared following the Cause – Pathway – Effect model. The potential impacts are summarised into the following categories for screening purposes.

- Direct impacts refer to impacts arising as a direct result of the works, such as physical disturbance of habitat, loss of habitat and direct mortalities of species.

- Indirect and secondary impacts do not have a straight-line route between cause and effect. It is potentially more challenging to ensure that all the possible indirect impacts of the project – in combination with other plans and projects - have been established. These can arise, for example, from works resulting in the deterioration of water quality of a waterbody, the introduction of invasive species within a European designated site, or the displacement of species through noise, vibration and increased activity associated with the works.

5.6.1. ‘Do Nothing’ Impact

The ‘do nothing’ impact would be not to carry out routine maintenance works on the bridge structures. This would result in no potential impacts being posed to ecological receptors.

5.6.2. Identification of potential impacts

5.6.2.1. Potential Impacts of proposed works

Impacts that could potentially occur as a result of the works can be categorised as follows: -

- Loss or modification of habitat
- Disturbance to key species
- Habitat or species fragmentation
- Reduction in species density
- Changes in key indicators of conservation value such as changes in water quality.

As described in Section 2 of this report, the purpose of the proposed works is to carry out routine maintenance works to keep the integrity of the structure in good condition. The proposed works are selected from the list of work items on the EIRSPAN database. The Work Orders are specific to each bridge, regarding the work items and quantities required. Thus, in terms of extent, the works are localised to each bridge and the duration is anticipated to vary from 1-2 hours over a number of visits or 1-2 days on a single visit to a bridge. As per the Contract, all instream works shall be conducted during July to September inclusive, unless otherwise agreed with and permitted by Inland Fisheries Ireland.

Loss or modification of habitat

Direct loss of habitat is caused where there is complete removal of a habitat type. Given the nature and extent of the proposed works, direct habitat loss will not occur as a result of the proposed works.

Habitat loss can also occur through the reduction of habitat quality and a loss of important habitat functions. The release and re-settling of suspended solids in a watercourse has the potential to indirectly affect instream habitat quality as it could modify the substrate composition of a riverbed or downstream instream habitats such as lake habitats (oligotrophic soft water lakes, soft water lakes with base rich influences, hard water lakes, natural eutrophic lakes). The works are not anticipated to introduce additional silts to the river, however they may suspend silts accumulated upstream of and beneath obstructions such as fallen trees and gates, pallets or fencing across bridge arches. The scale of disturbance of accumulated silts as a result of the works is anticipated to be minor, however depending on the respective proximity and sensitivity of habitats and species to the works, uncertainty remains regarding the significance of the potential impact. Thus, the precautionary principle has been applied and this impact is considered further in this assessment.

Disturbance to key species

Key species are defined as those listed on the Annexes of the EU Habitats Directive and Birds Directive for which sites are designated. Disturbance to a species can be direct through the physical disturbance of that species, such as accessing the watercourse and erecting scaffolding where freshwater pearl mussel is present at the bridge or the repair and maintenance of embankment integrity.

Disturbance to a species can also be indirect. Sources of such disturbance could be increased levels of noise, vibration, light and presence of humans at a bridge during the works that could result in the displacement of species. However, given the location of these bridges on national road, and the nature and duration of the works, the displacement of species from suitable habitat areas, e.g. wintering birds from feeding or roosting/breeding areas, is not anticipated to be significant.

Habitat / species fragmentation

Habitat and species fragmentation can occur through the disruption or loss of habitats that provide connectivity between existing ecological units. The proposed works will not result in the removal of habitats or linear landscape features such as hedgerows and treelines. Where vegetation is to be removed on the riverbank this is restricted to within 1m of the bridge structure under the Contract.

Rivers are corridors for the movement and migration of species. The nature of the proposed works is such that only localised de-watering will be required where necessary, e.g. repair of undermining to a pier or abutment. Localised de-watering activities at a multiple arch bridge do not present impacts regarding the movement of species as one arch will always be open and unobstructed.

Where a bridge is a single span structure, there is potential for the temporary obstruction of species movement. The only bridge that is single span at which scour repairs are called up is bridge MO-N59-063.00 Gowlan Bridge. There are no base protection works called up for any single span structures.

The proposed works at this single span structure (Gowlan Bridge) will involve localised dewatering. The works will not require the isolation of the entire channel to conduct works and therefore will not result in a barrier to the movement of species. Thus, impacts of habitat and species fragmentation are not anticipated.

Reduction in species diversity

Reduction in species density may result from a number of impacts discussed above. It may result from the loss and reduction of habitat area and type, disturbance, fragmentation or changes in the quality and functions of their supporting habitat.

As discussed above, the proposed works could potentially cause the modification of river substrates due to the disturbance and re-settling of accumulated silts upstream of and beneath obstructions that are impeding flow in the channel, e.g. fallen trees. This impact could affect species such as freshwater

pearl mussel, crayfish, salmon and lamprey and indirectly affect otter due to the biomass of their food source being affected.

Changes in water quality

The key indicators of conservation value for sites that could potentially be affected by the proposed works is the quality of surface waters. The works will not affect the hydrological regime of waterbodies that the bridges span or the waterbodies that have connectivity to the bridge sites.

The works have the potential to impact upon the quality of surface waters through the disturbance of accumulated silts, runoff of waters resulting from power hosing, lime mortar and concrete used during masonry repointing and masonry and concrete repair. Although the release of any materials to a watercourse used during the works would be an accidental release of such materials, the scale of which is not likely to be significant, the precautionary principle has been applied and this potential impact is carried forward in this assessment.

5.6.3. Categorisation of EIRSPAN work types

Given the potential impacts described above, the EIRSPAN work types were categorised regarding their potential to give rise to negative impacts to a SAC and / or SPA.

Table 5-4 details the complete list of potential works that can be called up for each bridge component under the contract. Works that are contained to bridge components such as the Bridge Surface, Footways/median and Expansion Joints are contained in nature and thus, due to the nature of the works and the lack of pathway to a receptor, negative impacts are not anticipated as a result of these works.

The works identified as having potential for negative impacts (Table 5-4) are listed in the Work Orders of the bridges being considered in this assessment. Thus, the works called up for these bridges have the potential to have a negative impact on the receiving environment.

Table 5-4 Potential negative impacts of work items.

Work Item	Potential impacts	
	No negative impact anticipated	Potential for negative impact
01 Clearance of watercourse		X
02 Installation of rubbing strip	X	
03 Removal of vegetation		X
04 Scour repairs		X
05 Removal of signage	X	
10 Cleaning of expansions joints	X	
12 Sealing of pavement cracks	X	
14 Maintenance of joint	X	
15 Maintenance of kerb stones	X	
16 Patching of potholes	X	
20 Pavement remedial works	X	
21 Sweeping and cleaning	X	
22 Maintenance of surface	X	
30 Cleaning of drain gullies	X	
31 Cleaning of drip-tubes	X	
32 Establish drainage facility	X	
33 Establish drainage channel	X	
35 Maintenance of drainage channel	X	
44 Maintenance of gabion		X
45 Maintenance of slope protection		X
47 Reshaping (imported materials)		X
50 Concrete repairs		X
52 High-pressure hosing of surface		X
54 Maintenance of bedding mortar	X	
55 Repair of parapet		X
56 Establish base protection		X
57 Maintenance of base protection		X
58 Cleaning of bearings	X	
59 Removal of graffiti		X
60 Masonry repointing		X
61 Masonry repairs		X
70 Patch-painting of steel	X	
72 Replacement of guardrail	X	
74 Tightening of bolts	X	
80 Repair of lighting	X	
81 Maintenance of structure ID	X	

Two work items listed in Table 5-4 above, which have been identified as having a potential to impact, are not part of the work order list being considered in this NIS. They are; *56 Establish base protection* and *57 Maintenance of base protection*. Of the works listed above, 11 were found to have a potential impact to negatively impact a SAC and / or SPA and are listed in Table 5-5.

Table 5-5 Work items identified as having negative impacts to be considered further.

Work Item	Potential Impacts of proposed works
01 Clearance of watercourse	Loss or modification of habitat Disturbance to key species Reduction in species diversity Changes in water quality
03 Removal of vegetation	Loss or modification of habitat Disturbance to key species Reduction in species diversity
04 Scour repairs	Loss or modification of habitat Disturbance to key species Reduction in species diversity Changes in water quality
44 Maintenance of gabion	Loss or modification of habitat Disturbance to key species Reduction in species diversity Changes in water quality
45 Maintenance of slope protection	Loss or modification of habitat Disturbance to key species Reduction in species diversity Changes in water quality
47 Reshaping (imported materials)	Loss or modification of habitat Disturbance to key species Reduction in species diversity Changes in water quality
50 Concrete repairs	Loss or modification of habitat Disturbance to key species Reduction in species diversity Changes in water quality
52 High-pressure hosing of surface	Changes in water quality
55 Repair of parapet	Disturbance to key species Reduction in species diversity Changes in water quality
59 Removal of graffiti	Reduction in species diversity Changes in water quality
60 Masonry repointing	Disturbance to key species Changes in water quality
61 Masonry repairs	Disturbance to key species Changes in water quality

5.6.4. Potential impacts during the works

The above section identifies the potential impacts posed by the proposed works, which are summarised below:-

- Indirect modification of instream substrate quality and structure due to the disturbance of and re-settling of accumulated silts within a channel upstream of or beneath obstructions in a channel that impede flow e.g. fallen trees,
- Direct physical disturbance of aquatic species regarding access of personnel on foot, erection of scaffolding and instream works,
- Indirect reductions in species density, such as freshwater pearl mussel, crayfish, salmon, lamprey and otter, as a result of changes instream habitat quality (re-settling of disturbed silt accumulations) and/ or surface water quality,
- Impacts to surface water quality resulting from the disturbance of instream accumulated silts and the accidental release of work materials to a watercourse.

Table 5-6 below details the pathway, receptor and impact for each of the EIRSPAN work types called up in the Work Orders for the 28 bridges.

Table 5-7 details the potential impacts posed at a bridge and the qualifying interests (QIs) potentially affected. The geographic location of the bridge, proposed works, nature of connectivity to a Natura 2000 site, and the site's structure, function and conservation objectives were taken into account when determining the potential impacts and qualifying interests within the zone of influence (ZoI).

5.6.5. Freshwater pearl mussel considerations

The NPWS freshwater pearl mussel dataset and 2018 project survey data was examined for each bridge being considered in this assessment. The presence of freshwater pearl mussel both at a bridge and upstream and downstream of a bridge were reviewed in relation to the proposed works detailed in the Work Orders and the potential impact posed by those works.

[redacted]

Where freshwater pearl mussel is located in the immediate vicinity of a bridge, there is a potential impact for direct physical disturbance to the species and indirect impacts through changes to surface water quality. Where freshwater pearl mussel is located at a remove from and downstream of a bridge, there is potential for indirect impacts through changes to surface water quality. Water quality best practice measures detailed in the mitigation measures in Section 5.8 will mitigate potential indirect impacts to freshwater pearl located downstream of bridges.

[redacted] The proposed works at each bridge will not require instream access. Best practice surface water quality mitigation measures (Section 5.8) will mitigate any potential indirect impacts to freshwater pearl mussel.

5.6.6. Potential impacts post completion of the works

The proposed works are to existing bridges on the national road network. The scope and nature of the proposed works are localised routine maintenance works to the structures. Thus, there shall be no alteration to the morphology or hydrological regime of the waterbodies in the vicinity of the bridges. The proposed works will not increase the usage of the riverbanks for agricultural or recreational purposes and there shall be no increased emissions to a watercourse post completion of the works. Therefore, direct and indirect impacts are not envisaged post completion of the works.

Table 5-6 Works, potential impacts and receptors.

Work Item	Pathway	Potential Impacts	Receptor
01 Clearance of watercourse	Land & Air	- Direct physical disturbance of aquatic species (Disturbance to key species)	Annex II species
	Surface water	- Indirect modification of instream substrate quality (Loss or modification of habitat) - Indirect reductions in species density - Indirect impacts to surface water quality	Surface water dependent Annex II species and Annex I habitats
03 Removal of vegetation	Land & Air	- Direct physical disturbance of aquatic species (Disturbance to key species)	Annex II species
	Surface water	- Indirect reductions in species density - Indirect impacts to surface water quality (Disturbance to key species)	Surface water dependent Annex II species and Annex I habitats
04 Scour repairs	Land & Air	- Direct physical disturbance of aquatic species (Disturbance to key species)	Annex II species
	Surface water	- Indirect modification of instream substrate quality (Loss or modification of habitat) - Indirect reductions in species density - Indirect impacts to surface water quality	Surface water dependent Annex II species and Annex I habitats
44 Maintenance of gabion	Land & Air	- Direct physical disturbance of aquatic species (Disturbance to key species)	Annex II species
	Surface water	- Indirect modification of instream substrate quality (Loss or modification of habitat) - Indirect reductions in species density - Indirect impacts to surface water quality	Surface water dependent Annex II species and Annex I habitats
45 Maintenance of slope protection	Land & Air	- Direct physical disturbance of aquatic species (Disturbance to key species)	Annex II species
	Surface water	- Indirect modification of instream substrate quality (Loss or modification of habitat) - Indirect reductions in species density - Indirect impacts to surface water quality	Surface water dependent Annex II species and Annex I habitats

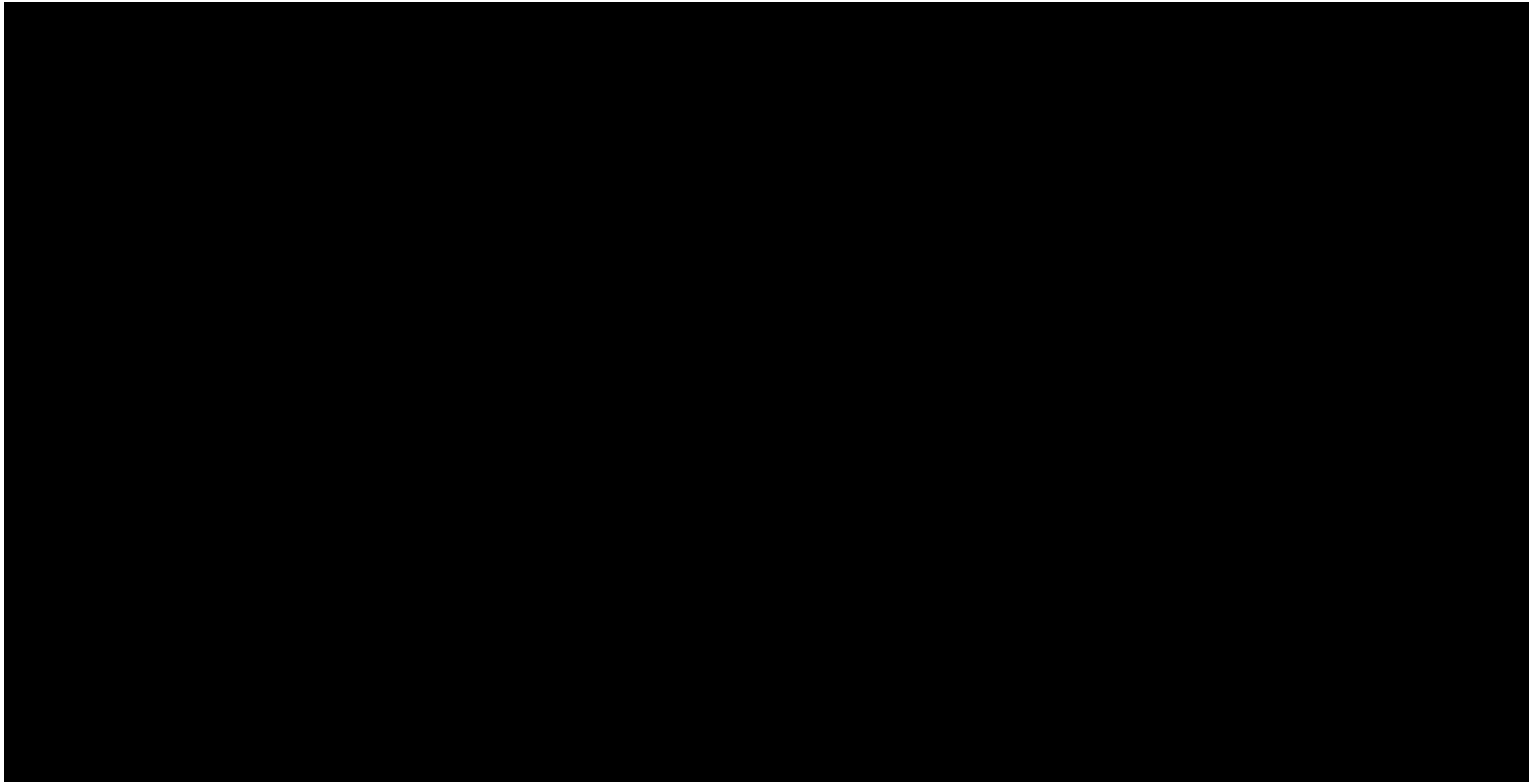
Work Item	Pathway	Potential Impacts	Receptor
47 Reshaping (imported materials)	Land & Air	- Direct physical disturbance of aquatic species (Disturbance to key species)	Annex II species
	Surface water	- Indirect modification of instream substrate quality (Loss or modification of habitat) - Indirect reductions in species density - Indirect impacts to surface water quality	Surface water dependent Annex II species and Annex I habitats
50 Concrete repairs	Land & Air	- Direct physical disturbance of aquatic species (Disturbance to key species)	Annex II species
	Surface water	- Indirect modification of instream substrate quality (Loss or modification of habitat) - Indirect reductions in species density - Indirect impacts to surface water quality	Surface water dependent Annex II species and Annex I habitats
52 High-pressure hosing of surface	Surface water	- Indirect impacts to surface water quality	Surface water dependent Annex II species and Annex I habitats
55 Repair of parapet	Land & Air	- Direct physical disturbance of aquatic species (Disturbance to key species)	Annex II species
	Surface water	- Indirect modification of instream substrate quality (Loss or modification of habitat) - Indirect reductions in species density - Indirect impacts to surface water quality	Surface water dependent Annex II species and Annex I habitats
59 Removal of graffiti	Surface water	- Indirect impacts to surface water quality	Surface water dependent Annex II species and Annex I habitats
60 Masonry repointing	Land & Air	- Direct physical disturbance of aquatic species (Disturbance to key species)	Annex II species
	Surface water	- Indirect impacts to surface water quality	Surface water dependent Annex II species and Annex I habitats
61 Masonry repairs	Land & Air	- Direct physical disturbance of aquatic species (Disturbance to key species)	Annex II species
	Surface water	- Indirect impacts to surface water quality	Surface water dependent Annex II species and Annex I habitats

Table 5-7 Potential Impacts to Natura 2000 sites at each bridge.

County	Structure_ID	Loss or modification of habitat	Physical disturbance of species	Reduction in species density	Deterioration of surface water quality	QIs within ZoI (via direct or indirect impacts)
Donegal	DL-N15-014.00	×	×	✓	✓	FWPM, salmon
Donegal	DL-N56-001.00	×	×	✓	✓	FWPM, salmon
Donegal	DL-N56-006.00	×	×	✓	✓	Mudflats and sandflats; SCIs of the SPA using the Eddrim estuary.
Donegal	DL-N56-033.00	×	×	✓	✓	Estuaries, mudflats and sandflats, otter
Donegal	DL-N56-046.00	×	×	✓	✓	Estuaries, mudflats and sandflats
Donegal	DL-N56-055.90	×	×	✓	✓	FWPM, salmon, otter
Donegal	DL-N56-060.00	✓	✓	✓	✓	FWPM, salmon, otter, oligotrophic waters, and oligotrophic to mesotrophic waters.
Galway City	GB-N06-006.00	×	×	✓	✓	Floating river vegetation, lamprey species, salmon, otter
Galway County	GC-N59-038.00	×	×	✓	✓	Oligotrophic to mesotrophic waters, slender naiad, salmon, otter, floating river vegetation.
Galway County	GC-N63-015.00	×	×	✓	✓	SCIs of the SPA using the River Suck
Galway County	GC-N63-019.00	×	×	✓	✓	SCIs of the SPA using the River Suck

County	Structure_ID	Loss or modification of habitat	Physical disturbance of species	Reduction in species density	Deterioration of surface water quality	QIs within ZoI (via direct or indirect impacts)
Leitrim	LM-N15-002.00	×	×	✓	✓	Mudflats and sandflats, large shallow inlets and bays, reefs.
Leitrim	LM-N16-012.00	✓	✓	✓	✓	Crayfish, lamprey species, salmon and otter
Leitrim	LM-N16-013.00	✓	✓	✓	✓	Crayfish, lamprey species, salmon and otter
Leitrim	LM-N16-018.00	×	×	✓	✓	Floating river vegetation habitat, otter.
Mayo	MO-N05-014.00	✓	×	✓	✓	Crayfish, lamprey species, salmon, otter
Mayo	MO-N05-022.00	✓	×	✓	✓	Crayfish, lamprey species, salmon, otter
Mayo	MO-N26-001.00	✓	×	✓	✓	Crayfish, lamprey species, salmon, otter
Mayo	MO-N26-003.00	×	×	✓	✓	Crayfish, lamprey species, salmon, otter
Mayo	MO-N26-007.00	✓	×	✓	✓	Crayfish, lamprey species, salmon, otter
Mayo	MO-N59-003.00	×	×	✓	✓	Crayfish, lamprey species, salmon, otter
Mayo	MO-N59-006.00	×	×	✓	✓	Crayfish, lamprey species, salmon, otter
Mayo	MO-N59-008.00	×	×	✓	✓	Crayfish, lamprey species, salmon, otter

County	Structure_ID	Loss or modification of habitat	Physical disturbance of species	Reduction in species density	Deterioration of surface water quality	QIs within ZoI (via direct or indirect impacts)
Mayo	MO-N59-024.00	×	×	✓	✓	SCIs of SPA using Tullaghan Bay
Mayo	MO-N59-026.00	×	×	✓	✓	SCIs of SPA using Tullaghan Bay
Mayo	MO-N59-042.00	×	×	✓	✓	Large shallow inlets and bays, otter
Mayo	MO-N59-063.00	×	×	✓	✓	FWPM, salmon, otter, floating river vegetation habitat
Mayo	MO-N59-066.00	×	✓	✓	✓	FWPM, salmon, otter, floating river vegetation habitat
Mayo	MO-N60-002.00	×		✓	✓	Crayfish, lamprey species, salmon, otter
Mayo	MO-N84-005.00	×	×	✓	✓	Oligotrophic/ oligotrophic to mesotrophic/ hard oligo-mesotrophic waters, and otter



5.7. Cumulative impacts

Local Authorities prepare County and Development Plans and Local Action Plans that set out policies and objectives for the development of the County during the period of the Plan. The Plans seek to secure the sustainable development and improvement of economic, environmental, cultural and social assets of the counties. These Plans under go Appropriate Assessment, for which a Natura Impact Report (NIR) was prepared for the Plans of the counties in the North West Region. The findings of the NIR were integrated into the Plans, ensuring that potential impacts were avoided, reduced or offset. Thus, an AA determination was made by the Local Authorities that the Plans would not adversely affect the integrity of Natura 2000 sites due to the incorporation of mitigation measures built into the Plans as a result of the AA process.

The Office of Public Works (OPW) has 12 arterial drainage and embankment schemes in the North West Region. The Corrib scheme is a very large and extensive scheme that is divided into 3 sub-schemes; Corrib Clare, Corrib Headford and Corrib Mask. A number of bridges are located within the same WFD catchment as the schemes but do not have hydrologically connectivity with the schemes. Thirteen bridges fall either within or are located upstream of a scheme.

The OPW has carried out a Strategic Environmental Assessment and NIS of the drainage maintenance activities for 2016-2021. Maintenance activities will have to under-go the AA process to ensure no adverse impacts to Natura 2000 sites and their designated habitats and species. Mitigation measures are set out in the SEA and NIS[4], which require further project-specific assessments to be carried out. Thus, given the nature and scale of the proposed routine maintenance bridge works, cumulative impacts with the OPW drainage programme are not anticipated.

Table 5-9 Bridges within / upstream of an OPW works scheme.

Bridge Code	Location relative to OPW scheme	OPW scheme (County)
GB-N06-006.00	Within	Corrib (Galway)
GC-N59-038.00	Ca. 4km upstream of scheme	Corrib (Galway)
MO-N84-005.00	Within	Corrib (Mayo)
MO-N60-002.00	Within	Moy (Mayo)
MO-N05-014.00	Within	Moy (Mayo)
MO-N05-022.00	Within	Moy (Mayo)
MO-N26-007.00	Ca. 4.7 upstream of scheme	Moy (Mayo)
MO-N26-003.00	Within	Moy (Mayo)
MO-N26-001.00	Within	Moy (Mayo)
MO-N59-003.00	Within	Moy (Mayo)
LM-N16-013.00	Within	Bonet
LM-N16-012.00	Within	Bonet
LM-N15-002.00	Within	Duff

Farmers and landowners may also undertake general agricultural operations in areas adjacent to the proposed work areas at each bridge, which could potentially give rise to impacts of a similar nature to those arising from the proposed works. This could potentially result in an additional increased risk to water quality of the watercourses downstream of the bridges. Many agricultural operations are periodic, not continuous in nature, and qualify as a Notifiable Action that requires consultation with National Parks and Wildlife Service in advance of the works e.g. reclamation, infilling or land drainage within 30m of the river, removal of trees or any aquatic vegetation within 30m of the river, and

[4] https://www.opw.ie/en/flood-risk-management/operations/environmentalactivities/arterial-drainage-maintenance-sea-2018-20121/

harvesting or burning of reed or willow[5]. Agricultural operations must also comply with the EC (Environmental Impact Assessment) (Agriculture) Regulations 2011 and amendment 2017 S.I. No. 456/2011 and 407/2017 in relation to activities covered by the regulations: -

- Restructuring of rural land holdings,
- Commencing use of uncultivated land or semi-natural areas,
- Land drainage works on lands used for agriculture.

A Natura Impact Statement is required under Regulation 9 if it is likely to have a significant effect on a European designated site. The drainage or reclamation of wetlands is controlled under the Planning and Development (Amendment) (No. 2) Regulations 2011 and the European Communities (Amendment to Planning and Development) Regulations 2011. Therefore, the in-combination effects of agricultural operations and the proposed culvert works are not likely to be significant.

Projects that have been granted planning permission in the vicinity of the structures in this assessment are located along the adjacent national and local roads. These generally include retention of existing developments, extensions to domestic dwellings, or the construction of new domestic dwellings or extensions to such dwellings. Regarding potential impacts to water quality, these projects will have to comply with the EPA's Code of Practice for Wastewater Treatment Systems for Single Houses (EPA, 2009; 2018) and abide by any conditions of the planning consent. [see MyPlan.ie].

A number of road schemes are proposed in the North West Region[6]. Examples of such infrastructure projects include are listed below. These road projects are all at different stages of design and procurement. These projects will be or would have been subject to Screening for AA, at a minimum. The proposed bridge maintenance works are localised, small scale works where the working period is short and temporary in nature. Mitigation measures, where applicable, are itemised for each bridge in Section 5.8 and following the application of the mitigation measures, cumulative impacts are not anticipated.

Table 5-10 TII Road Schemes in the North West Region.

County	Scheme	Phase
Galway	Dublin to Galway Greenway	Planning (some sections in construction phase (TII, *pers.comm*))
Galway	Motorway Service Areas (Tranche 4)	Planning
Galway	N6 Galway City Transport Project	Planning
Galway	N59 Clifden to Oughterard	Planning
Mayo	N59 Westport to Mulranny	Construction
Mayo	N5 Westport to Turlough	Planning (some sections in construction phase (TII, *pers.comm*))
Sligo	N4 Collooney/ Castlebaldwin	Planning
Donegal	N56 Mountcharles to Inver	Construction
Donegal	N56 Dungloe to Glenties	Planning
Donegal	N14/N15 to A5 Link	Planning
Roscommon & Longford	N5 Ballaghaderreen-Scramoge	Planning

[5] Notifiable Actions https://www.npws.ie/farmers-and-landowners/notifiable-actions

[6] TII Road Scheme Activity MapViewer https://www.tii.ie/projects/road-schemes/# (last accessed 14/11/2019)

5.8. Mitigation Measures

The following section gives a summary of each bridge, the works proposed and outlines mitigation measures for work elements in order to avoid adverse effects on the integrity of a Natura 2000 site.

5.8.1. Donegal Structures

5.8.1.1. Drumrath Bridge/ Laghey to Ballybofey Rd [DL-N15-014.00]

The structure is comprised of 2 corrugated steel pipes with 3.95m diameter each. There is steel safety barrier on both sides of the carriageway and a light steel railing on the headwalls. The structure carries the N15 over the River Drumenny. The structure is within Lough Eske and Ardnamona Wood SAC and located 3.2km upstream of the Donegal Bay SPA. Plate 5-1 shows the east elevation.

Plate 5-1 Drumrath Bridge.

The qualifying interests of the Lough Eske and Ardnamona Wood SAC are listed in Section 5.2. The qualifying interests that could be impacted are freshwater pearl mussel and salmon. The potential impacts to the SAC are the deterioration of surface water quality and reduction in species density.

There are no records for freshwater pearl mussel at the bridge. [redacted]

Proposed Works

The proposed works at this bridge are detailed in Table 5-11 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-11 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m strip either side of carriageway to be swept and cleaned (20m²).	Screened out – works within the bridge deck and therefore no pathway.
Footways/ median	Footways to be swept and cleaned included removal of vegetation (59.5m²).	Screened out – works within the bridge deck and therefore no pathway.
Embankments/ Revetments	Vegetation removal 1m of structure and on top of structure (560m²).	Screened in – this activity could result in the exposure of loose soils, resulting in a sediment load to the river.
Riverbed	Vegetation to be removed below structure and 5m either side (10m²).	Screened in – will require instream access.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Clearance of watercourse (Debris Removal)

Vegetation debris and waste debris shall only be removed from watercourses by hand. As per the Works Requirements Specification document, no live aquatic vegetation or silt shall be removed from the riverbed. Where there is any doubt the Contractor must seek the advice of their appointed ecologist. Care is to be taken not to disturb the riverbed when removing debris from the watercourse in order to minimise any disturbance of silt.

For large areas of debris removal, such as fallen trees, any plant or machinery used in the removal process shall not be permitted to enter the watercourse. In such cases where there is a risk that large areas of silt have accumulated behind an obstruction, which could be released by its removal, these must be considered on a case by case basis and advice of the Contractor's ecologist must be sought. Where there is a risk of significant silt release, which would result in a plume similar to that of Category 3 'A Lot of visible Silt' (NS2, 2009), appropriate measures to contain such silt shall be placed downstream of the works area prior to the commencement of works.

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments or from the bridge where freshwater pearl mussel is situated within the immediate vicinity of the embankments and/ or bridge. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of

the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Lough Eske and Ardnamona Wood SAC or any other European site.

5.8.1.2. River Eske Bridge [DL-N56-001.00]

The River Eske Bridge is a 3-span reinforced concrete arch bridge. The substructure piers consist of arched columns, with the end spans reinforced concrete slabs spanning from the arch to abutments. The mid-span is 14m and the side spans are 12.4m each. The structure is within Lough Eske and Ardnamona Wood SAC and located 1.7km upstream of the Donegal Bay SPA. Plate 5-2 shows the north elevation.

Plate 5-2 River Eske Bridge.

The qualifying interests of the Lough Eske and Ardnamona Wood SAC are listed in Section 5.2. The qualifying interests that could be impacted are freshwater pearl mussel and salmon. The potential impacts to the SAC are the deterioration of surface water quality and reduction in species density.

There are records for freshwater pearl mussel at the bridge. [redacted]

Proposed Works

The proposed works at this bridge are detailed in Table 5-12 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-12 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m strip along both parapets to be swept and cleaned including the removal of vegetation from the base of the parapet (80m²).	Screened out – works within bridge deck and therefore no pathway.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	Gullies to be cleaned (4 no.).	Screened out – cleaning of gullies is carried out by rodding or suctioning, therefore no pathway.
Expansion joints	Vegetation to be removed from expansion joints (4m²).	Screened out – works within bridge deck and therefore no pathway.
Parapets/ Safety barriers	Minor cracking in parapet to be repaired (0.01m²).	Screened in – concrete repair works have the potential to impact on surface water quality through accidental spillage.
Parapets/ Safety barrier	Areas of patch painting required along parapet.	Screened out – works will be carried out within the bridge deck.
Parapets/ Safety barrier	1m² of mesh to be replaced due to deformation. Total area 88m² (1it).	Screened out – works will be carried out within the bridge deck.
Embankments/ Revetments	Replace tiles which have been removed (60m²).	Screened in – replacement of tiles will require the use of adhesive and grouting materials adjacent to the watercourse.
Wing/ spandrel/ retaining walls	Graffiti removal from wing walls (10m²).	Screened in – potential for chemical agents to enter the adjacent watercourse.
Abutments	Graffiti removal from wing abutments (30m²).	Screened in – potential for chemical agents to enter the adjacent watercourse
Piers	Graffiti removal from piers (10m²).	Screened in – potential for chemical agents to enter the adjacent watercourse.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments or from the bridge where freshwater pearl mussel is situated within the immediate vicinity of the embankments and/ or bridge. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

Concrete repairs

Where personnel cannot reach the works area from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk

to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the concrete works may include vegetation removal. Loose and cracked material shall be raked out to sound material and the area cleaned by hand. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of materials shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no material or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste material entering the watercourse. Once the area has been repaired and brushed back to the desired finish, the geotextile will be carefully removed and the waste material will be removed off-site and disposed of appropriately at an approved site.

Tile Replacement

The replacement of tiles will require the use of adhesive/bedding and grouting materials. These materials shall be mixed at least 25 metres from the riverbank. The materials shall be brought to the revetment in small manageable quantities to avoid the risk of spillage, e.g. one bucket carried by one person at a time.

Graffiti Removal

Graffiti removal is not permitted at this structure and shall not be carried out by the Contractor.

Access Restrictions

[redacted]

Although, the proposed works at the bridge will not require instream access, there should be no access to the river channel by personnel during the works.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Lough Eske and Ardnamona Wood SAC or any other European site.

5.8.1.3. Eddrim Bridge [DL-N56-006.00]

The structure is comprised of 3 precast reinforced concrete pipes with 1.8m diameter each. There are masonry parapets on both sides of the carriageway. The riverbed is tidal. The structure is within the Donegal Bay (Murvagh) SAC and the Donegal Bay SPA. Plate 5-3 shows the south elevation.

Plate 5-3 Eddrim Bridge.

The qualifying interests of the Donegal Bay (Murvagh) SAC and Donegal Bay SPA are listed in Section 5.2. The qualifying interests that could be impacted are Mudflats and sandflats of the SAC and qualifying bird species of the SPA using the Eddrim estuary. The potential impacts are the deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-13 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-13 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m on north side 3m strip on south side including vegetation at the base of parapet (40m²).	Screened out – works within the bridge deck and therefore no pathway.
Footways/ Median	Footways to be swept and cleaned including the removal of vegetation (22.8 m²).	Screened out – works within the bridge deck and therefore no pathway.
Parapets/ Safety barrier	Vegetation removal from both parapets (5m²).	Screened out – the parapets on the SAC/ SPA side of the structure are set back and the works can be carried out on foot.
Parapets/ Safety barriers	Masonry repointing to parapets where vegetation was removed (5m²).	Screened in – masonry repointing may be carried out over water on the upstream side of the structure and therefore a surface water pathway present.

Bridge Component	Work Element	Screening Recommendation
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed (12m²).	Screened in – this activity could result in the exposure of loose soils, resulting in a sediment load to the river.
Embankments/ Revetments	Debris to be removed from boulders above structure. Total area 150m² (1it).	Screened out – removal of vegetation from the boulders can be carried out on foot.
Wing/ Spandrel/ Retaining Walls	Seaweed and moss to be removed from wing walls (12m²).	Screened out – removal of vegetation is over land and can be carried out on foot.
Other elements	Vegetation to be removed from along pipe structures. Total area 720m² (1it).	Screened out – removal of vegetation from the along pipe structures can be carried out on foot.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

Masonry Repointing

In some locations repointing over water will be possible on foot; where the mason cannot reach the area of repointing from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the repointing work will include vegetation removal; loose and cracked pointing shall be raked out to sound material and the joint cleaned by hand. The joints will then be dampened, and mortar will be pointed flush with the masonry face. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of mortar shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no lime mortar or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste mortar entering the watercourse. Once the area has been repointed and brushed back to the desired finish

the geotextile will be carefully removed and the waste mortar will be removed off-site and disposed of appropriately at an approved site.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the Donegal Bay (Murvagh) SAC and the Donegal Bay SPA or any other European site.

5.8.1.4. Gweebarra Bridge [DL-N56-033.00]

The Gweebarra Bridge is a 11-span reinforced concrete arch bridge with in-situ concrete parapets on both sides of the carriageway. The maximum span is 18.29m and the minimum span is 8.80m. Spans 3/5/7/9 are suspended spans of 8.64m length. The structure is within the West of Ardara/Maas Road SAC. Plate 5-4 shows the west elevation.

Plate 5-4 Gweebarra Bridge.

The qualifying interests of the West of Ardara/Maas Road SAC are listed in Section 5.2. The qualifying interests that could be impacted are estuaries, otter, mudflats and sandflats. The potential impacts to the SAC are the deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-14 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-14 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m strip either side of carriageway to be swept and cleaned including the removal of vegetation from the kerb stone (360m²).	Screened out - works within the bridge deck and therefore no pathway.
Bridge surface	Gullies to be cleaned (2 no.).	Screened out – gullies will be rodded or suctioned and therefore, no pathway.
Footways/ Median	Footways to be swept and cleaned including the removal of vegetation from the base of the parapet (360m²).	Screened out - works within the bridge deck and therefore no pathway.
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed. Vegetation mostly consists of bushes (24m²).	Screened in - this activity could result in the exposure of loose soils, resulting in a sediment load to the river.
Piers	Areas of concrete patch repair required to several piers: Vertical cracking to pier 2 east column. Local spalling Pier 2 crosshead and local delaminating concrete to transverse beam above pier 2 (0.8m²).	Screened in – concrete repair works have the potential to impact on surface water quality through accidental spillage.
Deck/ slab/ arch barrel	Span 3, delaminating concrete centre of span 2 at both ends, adjacent to previous repair at east end of span 3, sprayed concrete. Exposed corroded rebar. Local delamination	Screened in – concrete repair works have the potential to impact on surface water quality through accidental spillage.
Beams/ girders/ transverse beams	Beam 2, from east in span 1, shows exposed reinforcement. The corroded exposed steel reinforcement should be cleaned and treated with anti-corrosion paint and cracks filled (0.1m²).	Screened in – concrete repair works have the potential to impact on surface water quality through accidental spillage.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments or from the bridge where freshwater pearl mussel is situated within the immediate vicinity of the embankments and/ or bridge. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

Concrete Repairs

Where personnel cannot reach the works area from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and

cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the concrete works may include vegetation removal. Loose and cracked material shall be raked out to sound material and the area cleaned by hand. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of materials shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no material or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste material entering the watercourse. Once the area has been repaired and brushed back to the desired finish, the geotextile will be carefully removed and the waste material will be removed off-site and disposed of appropriately at an approved site.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the West of Ardara/Maas Road SAC or any other European site.

5.8.1.5. Bedlam Bridge [DL-N56-046.00]

The Bedlam Bridge is a 9.12m single span masonry arch bridge with masonry arch extension. There are masonry parapets on both sides of the carriageway. The rise of arch barrel at crown is 3.74m. The structure carries N56 over the River Glenna. Bedlam Bridge is within the Ballyness Bay SAC. Falcarragh to Meenlaragh SPA is ca. 1.8km downstream of the bridge. The Plate 5-5 shows the south elevation.

Plate 5-5 Bedlam Bridge.

The qualifying interests of the Ballyness Bay SAC are listed in Section 5.2. The qualifying interests that could be impacted are estuaries and mudflats and sandflats. The potential impacts to the SAC are the deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-15 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-15 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m strip along both parapets to be swept and cleaned including the removal of vegetation from the base of the parapet (20m²).	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Pedestrian footway adjacent to bridge to be swept and cleaned (40m²).	Screened out - works within the bridge deck and therefore no pathway.
Parapets/ Safety barrier	Vegetation to be removed from parapets. 3m² roadside, 1m² river side. (4m²).	Screened out – removal of vegetation may require instream access of the erection of scaffolding, however this will not affect the qualifying interests of the SAC.
Parapets/ Safety barrier	Masonry to be repointed where vegetation was removed (4m²).	Screened in – use of wet mortar over water and therefore a surface water pathway is present.

Bridge Component	Work Element	Screening Recommendation
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed. Vegetation mostly consists of bushes (24m²).	Screened in - this activity could result in the exposure of loose soils, resulting in a sediment load to the river.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

Masonry Repointing

In some locations repointing over water will be possible on foot; where the mason cannot reach the area of repointing from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the repointing work will include vegetation removal; loose and cracked pointing shall be raked out to sound material and the joint cleaned by hand. The joints will then be dampened, and mortar will be pointed flush with the masonry face. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of mortar shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no lime mortar or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste mortar entering the watercourse. Once the area has been repointed and brushed back to the desired finish the geotextile will be carefully removed and the waste mortar will be removed off-site and disposed of appropriately at an approved site.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of

the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the Ballyness Bay SAC or any other European site.

5.8.1.6. N56 Barnes Bridge [DL-N56-055.90]

The N56 Barnes Bridge is a 4.2m single span reinforced concrete structure. The bridge is a portal structure constructed of precast inverted U-shaped units on concrete base. There are steel safety barriers before the masonry parapets on both sides of the carriageway. The structure is located 3.2km upstream of the Leannan River SAC and 10.4km upstream of the Lough Fern SPA. Plate 5-6 shows the west elevation.

Plate 5-6 M56 Barnes Bridge.

The qualifying interests of the Leannan River SAC and Lough Fern SPA are listed in Section 5.2. The qualifying interests that could be impacted are freshwater pearl mussel, salmon and otter. The potential impacts to the SAC are the deterioration of surface water quality and reduction in species density.

There are no records for freshwater pearl mussel at the bridge. This bridge was surveyed for freshwater pearl mussel in 2018 as part of this project. No freshwater pearl mussel were found within 50m upstream or downstream of the bridge. [redacted]

Proposed Works

The proposed works at this bridge are detailed in Table 5-16 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-16 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m strip either side of carriageway to be swept and cleaned including the removal of vegetation from the kerb stone (14m²).	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Footways to be swept and cleaned including the removal of vegetation from the base of the parapet (14m²).	Screened out - works within the bridge deck and therefore no pathway.
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed. Vegetation mostly consists of dense bushes (24m²).	Screened in - this activity could result in the exposure of loose soils, resulting in a sediment load to the river.
Abutments	There is spalling of concrete between the joints on the abutments which should be repaired (1m²).	Screened in – concrete repair works have the potential to impact on surface water quality through accidental spillage.
Deck/ Slab/ Arch barrel	The joint at unit 1 on the soffit has failed, repair required 4m (1it).	Screened in – concrete repair works have the potential to impact on surface water quality through accidental spillage.
Riverbed	Debris and vegetation under and within 5m of structure to be removed. Access required: None (35m²).	Screened in – although this bridge is outside the SAC, this work element is screened in due to risk of silt release with freshwater pearl mussel located downstream.

Mitigation Measures

Clearance of watercourse (Debris Removal)

Vegetation debris and waste debris shall only be removed from watercourses by hand. As per the Works Requirements Specification document, no live aquatic vegetation or silt shall be removed from the riverbed. Where there is any doubt the Contractor must seek the advice of their appointed ecologist. Care is to be taken not to disturb the riverbed when removing debris from the watercourse in order to minimise any disturbance of silt.

For large areas of debris removal, such as fallen trees, any plant or machinery used in the removal process shall not be permitted to enter the watercourse. In such cases where there is a risk that large areas of silt have accumulated behind an obstruction, which could be released by its removal, these must be considered on a case by case basis and advice of the Contractor's ecologist must be sought. Where there is a risk of significant silt release, which would result in a plume similar to that of Category 3 'A Lot of visible Silt' (NS2, 2009), appropriate measures to contain such silt shall be placed downstream of the works area prior to the commencement of works.

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments or from the bridge where freshwater pearl mussel is situated within the immediate vicinity of the embankments and/ or bridge. As per the requirements of the Contract, if the Contractor encounters invasive plant

species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

Concrete repairs

Where personnel cannot reach the works area from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the concrete works may include vegetation removal. Loose and cracked material shall be raked out to sound material and the area cleaned by hand. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of materials shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no material or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste material entering the watercourse. Once the area has been repaired and brushed back to the desired finish, the geotextile will be carefully removed and the waste material will be removed off-site and disposed of appropriately at an approved site.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the Leannan River SAC and Lough Fern SPA or any other European site.

5.8.1.7. Milltown Bridge [DL-N56-060.00]

The Milltown Bridge is a 14.59m single span reinforced concrete bridge with steel parapets on both sides of the carriageway. The structure carries N56 over the River Leannan. The structure is within the Leannan River SAC and located 3km upstream of the Lough Fern SPA. Plate 5-7 shows the west elevation.

Plate 5-7 Milltown Bridge.

The qualifying interests of the Leannan River SAC are listed in Section 5.2. The qualifying interests that could be impacted are freshwater pearl mussel, salmon, otter, oligotrophic waters, and oligotrophic to mesotrophic waters. The potential impacts to the SAC are the loss or modification of habitat, physical disturbance of species, the deterioration of surface water quality and reduction in species density.

[redacted] This bridge was surveyed for freshwater pearl mussel in 2018 for this project. No freshwater pearl mussel were found at the bridg [redacted]

Proposed Works

The proposed works at this bridge are detailed in Table 5-17 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-17 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m strip either side of carriageway to be swept and cleaned including the removal of vegetation from the kerb stone (30m²).	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Footways and median to be swept and cleaned including the removal of vegetation from the base of the parapet (60m²).	Screened out - works within the bridge deck and therefore no pathway.

Bridge Component	Work Element	Screening Recommendation
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed. Vegetation mostly consists of trees (20m²).	Screened in - this activity could result in the exposure of loose soils, resulting in a sediment load to the river.
Riverbed	Debris, silt and vegetation under and within 5m of structure to be removed. Access required: Boat (20m²).	Screened in.

Mitigation Measures

Access Restrictions

[redacted] There shall be no access to the river channel by personnel during the works.

Clearance of watercourse (Debris Removal)

The work order states that for the removal of debris and vegetation from the channel, a boat will be used. As stated above, there shall be no access to the river channel by personnel.

Vegetation debris and waste debris shall only be removed from the watercourse by hand. As per the Works Requirements Specification document, no live aquatic vegetation or silt shall be removed from the riverbed. Where there is any doubt the Contractor must seek the advice of their appointed ecologist. Care is to be taken not to disturb the riverbed when removing debris from the watercourse in order to minimise any disturbance of silt.

For large areas of debris removal, such as fallen trees, any plant or machinery used in the removal process shall not be permitted to enter the watercourse. In such cases where there is a risk that large areas of silt have accumulated behind an obstruction, which could be released by its removal, these must be considered on a case by case basis and advice of the Contractor's ecologist must be sought. Where there is a risk of significant silt release, which would result in a plume similar to that of Category 3 'A Lot of visible Silt' (NS2, 2009), appropriate measures to contain such silt shall be placed downstream of the works area prior to the commencement of works. If silt build up is present behind the debris and vegetation to be removed, the placement of downstream silt measures downstream must to carried out in consultation with an ecologist so as not to disturb pearl mussel.

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. As stated above, personnel shall not enter the river channel. Strict adherence to biosecurity procedures and protocols is also a requirement.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments or from the bridge where freshwater pearl mussel is situated within the immediate vicinity of the embankments and/ or bridge (as outlined above). As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Leannan River SAC or any other European site.

5.8.2. Galway City Structures

5.8.2.1. Terryland River Bridge No.3 [GB-N06-006.00]

The structure is comprised of 2 corrugated steel pipes with 2.80m diameter each. Each culvert is in two sections. There is the galvanised corrugated steel pipe 15m in length to the east side and then a 5 degree kink to the second section which is also a corrugated steel pipe but with a bituminous coating. The structure is located 1.2km upstream of the Lough Corrib SAC and 3.7km upstream of the Inner Galway Bay SPA. Plate 5-8 shows the east elevation.

Plate 5-8 Terryland River Bridge No. 3.

The qualifying interests of the Lough Corrib SAC and the Inner Galway Bay SPA are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation, lamprey species, salmon and otter. The potential impacts to the SAC are the deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-18 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-18 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	Sweep and clean 1m wide strip of bridge surface along the full width of structure (45m²).	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Sweep and clean the footways and bicycle lanes at both sides of the carriageway (90m²).	Screened out - works within the bridge deck and therefore no pathway.
Parapets/ Safety barrier	Tighten 4 no. holding down bolts on the southern-most post on the west parapet (4 no.).	Screened out - works within the bridge deck and therefore no pathway.
Embankments/ Revetments	Removal of vegetation 1m clearance on all embankments (8m²).	Screened in - this activity could result in the exposure of loose soils, resulting in a sediment load to the river.
Piers	Removal of vegetation (1m²).	Screened out – likely to require instream access. Access on foot or the erection of scaffolding will not impact the qualifying interests of the SAC. No LSE anticipated.
Piers	Areas of pier 1 and pier 2 concrete loss to be repaired on western side (2m²).	Screened in – concrete repair works have the potential to impact on surface water quality through accidental spillage.
Piers	Masonry repair on eastern side between pipes (0.2m³).	Screened in – use of wet mortar over water and therefore a surface water pathway is present.
Riverbed	Debris including vegetation to be removed from both sides of the structure.	Screened in - although this bridge is outside the SAC, this work element is screened in due to risk of silt release and a surface water connectivity to the SAC.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area. Japanese knotweed is present upstream of the proposed works area, and thus, this area should be cordoned off and no disturbance of the area should occur.

Concrete Repairs / Masonry Repointing

In some locations works over water will be possible on foot; where the mason cannot reach the repointing area from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile

from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the repointing work will include vegetation removal; loose and cracked pointing shall be raked out to sound material and the joint cleaned by hand. The joints will then be dampened, and mortar will be pointed flush with the masonry face. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of mortar shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no lime mortar or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste mortar entering the watercourse. Once the area has been repointed and brushed back to the desired finish the geotextile will be carefully removed and the waste mortar will be removed off-site and disposed of appropriately at an approved site.

Note: *The same principles apply to concrete works over water, i.e. piers 1 and 2 on western side.*

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Lough Corrib SAC and the Inner Galway Bay SPA or any other European site.

5.8.3. Galway County Structures

5.8.3.1. Letterfore Bridge [GC-N59-038.00]

The Letterfore Bridge is a 3.67m single span masonry arch bridge with reinforced concrete extension to north end. The rise of arch barrel at crown is 1.49m. The bridge is located in the Connemara Bog Complex SAC and located 12.6km upstream of the Lough Corrib SPA. Plate 5-9 shows the north elevation.

Plate 5-9 Letterfore Bridge.

The qualifying interests of the Connemara Bog Complex SAC and the Lough Corrib SPA are listed in Section 5.2. The qualifying interests that could be impacted are oligotrophic to mesotrophic waters, slender naiad, salmon, otter and floating river vegetation. The potential impacts to the SAC are the deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-19 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-19 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	Sweep and clean 1m wide strip of bridge surface along the full width of structure (10m^2).	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Footways to be swept and cleaned including the removal of vegetation (2.8m^2).	Screened out - works within the bridge deck and therefore no pathway.
Parapets/ Safety barrier	Vegetation to be cleared from both internal and external faces of both parapets (28m^2).	Screened in - removal of vegetation may require instream access and the erection of scaffolding.
Parapets/ Safety barrier	Replace damage concrete coping to match existing (1m^2).	Screened in - concrete repair works have the potential to impact on surface water quality through accidental spillage.

Bridge Component	Work Element	Screening Recommendation
Parapets/ Safety barrier	Repair areas of cracking on the parapets (1m).	Screened in - concrete repair works have the potential to impact on surface water quality through accidental spillage.
Parapets/ Safety barrier	Areas of loose and missing mortar to be re-pointed on both internal and external faces of parapets. Expected quantity includes repointing to follow removal of vegetation (28m2).	Screened in - use of wet mortar over water and therefore a surface water pathway is present.
Embankments/ Revetments	Areas of vegetation to be removed from the embankments at both sides of structure (12m^2).	Screened in - this activity could result in the exposure of loose soils, resulting in a sediment load to the river.
Wing/ Spandrel/ Retaining Walls	Removal of vegetation on south wingwalls and spandrel (18m^2). The north wingwalls needs removal of vegetation (10m^2).	Screened in - removal of vegetation may require instream access and the erection of scaffolding.
Deck/ Slab/ Arch barrel	Areas of mortar loss and cracks to be repointed (5m²).	Screened in - use of wet mortar over water and therefore a surface water pathway is present.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments or from the bridge where freshwater pearl mussel is situated within the immediate vicinity of the embankments and/ or bridge. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

Concrete Repairs / Repair of Parapet / Masonry Repointing / Masonry Repairs

In some locations repointing over water will be possible on foot; where the mason cannot reach the area of repointing from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the repointing work will include vegetation removal; loose and cracked pointing shall be raked out to sound material and the joint cleaned by hand. The joints will then be dampened, and

mortar will be pointed flush with the masonry face. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of mortar shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no lime mortar or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste mortar entering the watercourse. Once the area has been repointed and brushed back to the desired finish the geotextile will be carefully removed and the waste mortar will be removed off-site and disposed of appropriately at an approved site.

Note: *The same principles apply to concrete works over water.*

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the Connemara Bog Complex SAC and the Lough Corrib SPA or any other European site.

5.8.3.2. Drinaun Bridge [GC-N63-015.00]

The Drinaun Bridge is comprised of 2 precast reinforced concrete pipes with 1.40m diameter each. There are concrete blockwall parapets on both sides of the carriageway. The structure is located 3.2km upstream of the River Suck Callows SPA. Plate 5-10 shows the north elevation.

Plate 5-10 Drinaun Bridge.

The qualifying interests of the River Suck Callows SPA are listed in Section 5.2. The qualifying interests that could be impacted are the designated bird species of the SPA using the River Suck. The potential impacts to the SPA are the deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-20 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-20 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	Sweeping and cleaning of road surface 0.5m from road edge both sides ($5m^2$).	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Sweeping and removal of vegetation in front of parapets 2m strip on both sides ($40m^2$).	Screened out - works within the bridge deck and therefore no pathway.
Riverbed	Removal of vegetation from watercourse on upstream and downstream side ($35m^2$).	Screened in - although this bridge is outside the SPA, this work element is screened in due to risk of silt release and a surface water connectivity to the SPA.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Clearance of watercourse (Debris Removal)

Vegetation debris and waste debris shall only be removed from watercourses by hand. As per the Works Requirements Specification document, no live aquatic vegetation or silt shall be removed from the riverbed. Where there is any doubt the Contractor must seek the advice of their appointed ecologist. Care is to be taken not to disturb the riverbed when removing debris from the watercourse in order to minimise any disturbance of silt.

For large areas of debris removal, such as fallen trees, any plant or machinery used in the removal process shall not be permitted to enter the watercourse. In such cases where there is a risk that large areas of silt have accumulated behind an obstruction, which could be released by its removal, these must be considered on a case by case basis and advice of the Contractor's ecologist must be sought. Where there is a risk of significant silt release, which would result in a plume similar to that of Category 3 'A Lot of visible Silt' (NS2, 2009), appropriate measures to contain such silt shall be placed downstream of the works area prior to the commencement of works.

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the River Suck Callows SPA or any other European site.

5.8.3.3. Mount Talbort Bridge [GC-N63-019.00]

The Mount Talbort Bridge is a 12-span masonry arch bridge carries N63 over the River Suck. The maximum span is 5.35m and the minimum span is 1.91m. All arches have been shotcreted. Each arch has two tie bars passing through its adjacent spandrel wall. The structure is within the River Suck Callows SPA. Plate 5-11 shows the east elevation.

Plate 5-11 Mount Talbot Bridge.

The qualifying interests of the River Suck Callows SPA are listed in Section 5.2. The qualifying interests that could be impacted are the designated bird species of the SPA using the River Suck. The potential impacts to the SPA are the deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-21 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-21 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	Sweeping and cleaning of surface 0.5m from road edge both sides (75m^2).	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Footways to be swept and cleaned including the removal of vegetation (50.6m^2).	Screened out - works within the bridge deck and therefore no pathway.
Parapets/ Safety barrier	Removal of vegetation from inside and outside of parapets and from top of parapets on both sides (80m^2).	Screened out – although this bridge is located within the SPA, this work element (with or without the use of scaffolding) will not impact the bird species of the SPA, due to the nature and scale of the works.
Parapets/ Safety barrier	Masonry repairs to 5m^2 area located on upstream east side and 5m^2 on downstream east side (1.5m).	Screened in – concrete repair works have the potential to impact on surface water quality through accidental spillage.

Bridge Component	Work Element	Screening Recommendation
Parapets/ Safety barrier	Masonry repointing where vegetation was removed and areas in need of repointing (80m^2).	Screened in – use of wet mortar over water and therefore a surface water pathway is present.
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed. Removal of vegetation, briars and small bushes on downstream east side beside parapet (10mX1m) (60m^2).	Screened in - this activity could result in the exposure of loose soils, resulting in a sediment load to the river.
Riverbed	2 small trees on upstream west side to be removed, trunk diameter 50mm (10m^2).	Screened in.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Clearance of watercourse (Debris Removal)

Vegetation debris and waste debris shall only be removed from watercourses by hand. As per the Works Requirements Specification document, no live aquatic vegetation or silt shall be removed from the riverbed. Where there is any doubt the Contractor must seek the advice of their appointed ecologist. Care is to be taken not to disturb the riverbed when removing debris from the watercourse in order to minimise any disturbance of silt.

For large areas of debris removal, such as fallen trees, any plant or machinery used in the removal process shall not be permitted to enter the watercourse. In such cases where there is a risk that large areas of silt have accumulated behind an obstruction, which could be released by its removal, these must be considered on a case by case basis and advice of the Contractor's ecologist must be sought. Where there is a risk of significant silt release, which would result in a plume similar to that of Category 3 'A Lot of visible Silt' (NS2, 2009), appropriate measures to contain such silt shall be placed downstream of the works area prior to the commencement of works.

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

Masonry Repointing/ Repair of parapet

In some locations repointing over water will be possible on foot; where the mason cannot reach the area of repointing from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed

of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the repointing work will include vegetation removal; loose and cracked pointing shall be raked out to sound material and the joint cleaned by hand. The joints will then be dampened, and mortar will be pointed flush with the masonry face. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of mortar shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no lime mortar or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste mortar entering the watercourse. Once the area has been repointed and brushed back to the desired finish the geotextile will be carefully removed and the waste mortar will be removed off-site and disposed of appropriately at an approved site.

Note: *The same principles apply to concrete works over water.*

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the River Suck Callows SPA or any other European site.

5.8.4. Leitrim Structures

5.8.4.1. Banduff River Bridge [LM-N15-002.00]

The Banduff River Bridge is a 15.5m single span reinforced concrete bridge with steel parapets on both sides of the structure. The structure lies on the inland boundary of the Bunduff Lough and Machair/Trawalua/Mullaghmore SAC. Plate 5-12 shows the south elevation.

Plate 5-12 Banduff River Bridge.

The qualifying interests of the Bunduff Lough and Machair/Trawalua/Mullaghmore SAC are listed in Section 5.2. The qualifying interests that could be impacted are the mudflats and sandflats, large shallow inlets and bays, and reefs. The potential impacts to the SAC are the deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-22 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-22 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	Sweeping and cleaning of roadway along kerb lines - 1m strip each side (58m^2).	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Sweeping, cleaning and removal of vegetation from footpaths (30mx1m each side).	Screened out - works within the bridge deck and therefore no pathway.
Embankments/ Revetments	Removal of vegetation from all embankments (32m^2).	Screened out – the vegetation at the bridge is not a component of the designated habitats of the SAC. Due to the location of the bridge and the nature of the coastal habitats downstream, LSE are not anticipated.
Riverbed	Removal of build-up of stones in the downstream riverbed (36m2).	Screened in.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Clearance of watercourse (Debris Removal)

Vegetation debris and waste debris shall only be removed from watercourses by hand. As per the Works Requirements Specification document, no live aquatic vegetation or silt shall be removed from the riverbed. Where there is any doubt the Contractor must seek the advice of their appointed ecologist. Care is to be taken not to disturb the riverbed when removing debris from the watercourse in order to minimise any disturbance of silt.

The stone build-up, downstream of the bridge, should not be removed from the channel. The stone build-up should be re-distributed within the river channel. It should be re-distributed so that it will not impede the passage of fish and lamprey during low flows. Strict biosecurity procedures and protocols shall be adhered to.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the Bunduff Lough and Machair/Trawalua/Mullaghmore SAC or any other European site.

5.8.4.2. Pollboy Bridge West [LM-N16-012.00]

The structure is a 6.1m single span masonry arch bridge with masonry parapets on both sides of the structure. The rise of arch span barrel at crown is 1.25m. The structure is within the Lough Gill SAC. Plate 5-13 shows the north elevation.

Plate 5-13 Pollboy Bridge West.

The qualifying interests of the Lough Gill SAC are listed in Section 5.2. The qualifying interests that could be impacted are the crayfish, lamprey species, salmon and otter. The potential impacts to the SAC are the loss or modification of habitat, physical disturbance of species, deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-23 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-23 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	Removal of vegetation and sweeping on the edges of the carriageway ($20m^2$)	Screened out - works within the bridge deck and therefore no pathway.
Bridge surface	Replace missing cat's eye at NE corner (1it).	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Soft verge on upstream side to be replaced by installing a rubbing strip in line with specification. Total area of bridge surface is $50m^2$. Area of soft verge to be replaced is $10m^2$.	Screened out - works within the bridge deck and therefore no pathway.
Parapets/ Safety barrier	Repair of damaged end of concrete block parapet with similar block ($0.1m^3$).	Screened in - concrete repair works have the potential to impact on surface water quality through accidental spillage.
Embankments/ Revetments	Removal of vegetation from all embankments ($40m^2$)	Screened in - this activity could result in the exposure of loose soils, resulting in a sediment load to the river.
Embankments/ Revetments	Reinforced concrete embankment on north bank damaged, reshaping required with rock armour ($3m^3$).	Screened in.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

Reshaping (imported materials)

Where reshaping is required along embankments and/or revetments measures, will be undertaken to ensure excavated material and imported material will not enter the watercourse. This will be done by installing temporary localised river diversions. Where necessary, these diversions will be placed along the river bank away from the working area using fixed shuttering and/or sealed sand bags. For one span structures such as the bridge above, the entire waterbody shall be diverted from upstream to downstream of the work area by means of a secure open flume arrangement, or through piping, or in

limited circumstances, by means of over pumping (IFI 2016). The Contractor's ecologist shall oversee fluming of the waterbody and specify the required area to be diverted. The Contractor's ecologist shall oversee fluming of the waterbody and specify the required area to be diverted.

If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. The plant will also not be permitted to enter or refuel within 50m of the watercourse. A back-up pump should be available on site.

The Contractor must notify Inland Fisheries Ireland prior to the commencement of the proposed instream works and the associated mitigation measures outlined above must be implemented. The Contractor's ecologist will advise on whether translocation of crayfish or electrofishing to remove fish from between the upstream and downstream sandbags is required. Where both translocation of crayfish and electrofishing are required, the translocation of crayfish shall be carried out prior to electrofishing. Where dewatering activities occur, instream silts should not be disturbed or removed from the river channel. If disturbance and/or removal of silts is required to access a bridge component, the silts shall be surveyed for the presence of lamprey ammocoetes. If lamprey ammocoetes are found, they shall be translocated to suitable receptor habitats. Receptor habitats shall be selected prior to lamprey removal from the silts. All surveying and electrofishing activities of protected species, i.e. crayfish, lamprey and salmonids, shall be carried out under licence.

All material to be imported shall be free from contaminants and invasive species.

Repair of parapet

The repair of the parapet wall should primarily be carried out from the bridge deck. If repair is required from the river side of the bridge and a working platform is required, it must be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Preparation for the works area may involve the removal of loose and cracked material, prior to be bedding material being put in place. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of materials shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no material or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste material entering the watercourse. Once the area has been repaired and brushed back to the desired finish, the geotextile will be carefully removed and the waste material will be removed off-site and disposed of appropriately at an approved site.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the Lough Gill SAC or any other European site.

5.8.4.3. Pollboy Bridge East [LM-N16-013.00]

The structure is a 6.1m single span masonry arch bridge with masonry parapets on both sides of the structure. The rise of arch span barrel at crown is 1.26m. The structure is located 0.2km upstream of the Lough Gill SAC. Plate 5-14 shows the south elevation.

Plate 5-14 Pollboy Bridge East.

The qualifying interests of the Lough Gill SAC are listed in Section 5.2. The qualifying interests that could be impacted are the crayfish, lamprey species, salmon and otter. The potential impacts to the SAC are the loss or modification of habitat, physical disturbance of species, deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-24 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-24 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	Sweeping and cleaning along road edge next to rubbing strip (5m^2).	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Footways to be swept and cleaned including the removal of vegetation (41m^2).	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Sweeping and cleaning footpath (10m^2).	Screened out - works within the bridge deck and therefore no pathway.
Embankments/ Revetments	Removal of vegetation (30m^2).	Screened in - this activity could result in the exposure of loose soils, resulting in a sediment load to the river.
Deck/ Slab/ Arch barrel	Masonry repair to lost stones in arch barrel 1m^2.	Screened in – use of wet mortar over water and therefore a surface water pathway is present.
Riverbed	Removal of debris from upstream and downstream sides of bridge (20m^2)	Screened in.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Clearance of watercourse (Debris Removal)

Vegetation debris and waste debris shall only be removed from watercourses by hand. As per the Works Requirements Specification document, no live aquatic vegetation or silt shall be removed from the riverbed. Where there is any doubt the Contractor must seek the advice of their appointed ecologist. Care is to be taken not to disturb the riverbed when removing debris from the watercourse in order to minimise any disturbance of silt.

For large areas of debris removal, such as fallen trees, any plant or machinery used in the removal process shall not be permitted to enter the watercourse. In such cases where there is a risk that large areas of silt have accumulated behind an obstruction, which could be released by its removal, these must be considered on a case by case basis and advice of the Contractor's ecologist must be sought. Where there is a risk of significant silt release, which would result in a plume similar to that of Category 3 'A Lot of visible Silt' (NS2, 2009), appropriate measures to contain such silt shall be placed downstream of the works area prior to the commencement of works.

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

Masonry Repairs

Repointing over water may be possible on foot; where the mason cannot reach the area of repointing from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the repointing work will include vegetation removal; loose and cracked pointing shall be raked out to sound material and the joint cleaned by hand. The joints will then be dampened, and mortar will be pointed flush with the masonry face. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of mortar shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no lime mortar or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste mortar entering the watercourse. Once the area has been repointed and brushed back to the desired finish the geotextile will be carefully removed and the waste mortar will be removed off-site and disposed of appropriately at an approved site.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the Lough Gill SAC or any other European site.

5.8.4.4. Meenaphuill Bridge [LM-N16-018.00]

The structure is a 3.05m single span masonry arch bridge with masonry parapets on both sides of the structure. The rise of the arch span barrel at the crown is 1.12m. The structure is within the Ben Bulben, Gleniff and Glenade Complex SAC. Plate 5-15 shows the south elevation.

Plate 5-15 Meenaphuill Bridge.

The qualifying interests of the Ben Bulben, Gleniff and Glenade Complex SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation habitat and otter. The potential impacts to the SAC are the deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-25 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-25 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	Sealing of transverse pavement crack using hot poured bitumen (5m).	Screened out - works within the bridge deck and therefore no pathway.
Bridge surface	Patch repair of pothole at road edge next to parapet ($2m^2$).	Screened out - works within the bridge deck and therefore no pathway.
Bridge surface	Sweeping, cleaning and removal of vegetation, 1m strip on either side adjacent to kerb line ($7m^2$).	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Soft verge to be replaced by installing a rubbing strip line with specification. Total area of bridge surface is $22m^2$. Area of soft to be replaced is ($4m^2$).	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Sweeping, cleaning and removal of vegetation from footpaths on either side ($56m^2$).	Screened out - works within the bridge deck and therefore no pathway.
Parapets/ Safety barrier	Vegetation to be removed from parapet walls. Vegetation mostly consists of brambles and ivy ($10m^2$).	Screened out – given the nature of the bridge and narrow cross-section of the river channel, vegetation removal will be carried out from the land. No LSE anticipated.
Parapets/ Safety barrier	Masonry repointing required where vegetation removed ($10m^2$).	Screened in – use of wet mortar over water and therefore a surface water pathway is present.
Parapets/ Safety barrier	Localised area of masonry loss, masonry repair required ($0.1m^3$).	Screened in – use of wet mortar over water and therefore a surface water pathway is present.
Embankments/ Revetments	Removal of vegetation from 1m strip on all four embankments ($80m^2$).	Screened in - this activity could result in the exposure of loose soils, resulting in a sediment load to the river.
Wing/ Spandrel/ Retaining Walls	Vegetation and tree root removal required on wingwalls ($3m^2$).	Screened out – given the nature of the bridge and narrow cross-section of the river channel, vegetation removal will be carried out from the land. No LSE anticipated.
Wing/ Spandrel/ Retaining Walls	Repoint where vegetation removed ($3m^2$).	Screened in – use of wet mortar over water and therefore a surface water pathway is present.
Deck/ Slab/ Arch barrel	Repair of transverse crack in bridge deck: 1 linear meter ($2m^2$).	Screened out - works within the bridge deck and therefore no pathway.
Riverbed	Removal of large stone and rock deposits on downstream side of bridge ($25m^2$).	Screened in.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

Concrete Repairs / Masonry Repointing / Masonry Repairs

In some locations repointing over water will be possible on foot; where the mason cannot reach the area of repointing from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the repointing work will include vegetation removal; loose and cracked pointing shall be raked out to sound material and the joint cleaned by hand. The joints will then be dampened, and mortar will be pointed flush with the masonry face. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of mortar shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no lime mortar or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste mortar entering the watercourse. Once the area has been repointed and brushed back to the desired finish the geotextile will be carefully removed and the waste mortar will be removed off-site and disposed of appropriately at an approved site.

Note: *The same principles apply to concrete works over water.*

Clearance of watercourse (Debris Removal)

Vegetation debris and waste debris shall only be removed from watercourses by hand. As per the Works Requirements Specification document, no live aquatic vegetation or silt shall be removed from the riverbed. Where there is any doubt the Contractor must seek the advice of their appointed ecologist. Care is to be taken not to disturb the riverbed when removing debris from the watercourse in order to minimise any disturbance of silt.

The stone build-up, downstream of the bridge, should not be removed from the channel if possible. The stone build-up should be re-distributed within the river channel. It should be re-distributed so that it will not impede the passage of fish and lamprey during low flows. Strict biosecurity procedures and protocols shall be adhered to.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the Ben Bulben, Gleniff and Glenade Complex SAC or any other European site.

5.8.5. Mayo Structures

5.8.5.1. Little River Bridge [MO-N05-014.00]

The Little River Bridge is a 3-span masonry arch bridge with reinforced concrete extension. The maximum span is 3.1m and the minimum span is 1.5m. The Reinforced Concrete deck slab is simply supported on both abutments and bears directly onto a 25mm thick timber board. The bridge is located 5.6km upstream of the River Moy SAC. Plate 5-16 shows the north elevation.

Plate 5-16 Little River Bridge.

The qualifying interests of the River Moy SAC are listed in Section 5.2. The qualifying interests that could be impacted are crayfish, lamprey species, salmon and otter. The potential impacts to the SAC are the loss or modification of habitat, deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-26 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-26 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m of sweeping and cleaning to road surface including removal of vegetation at the base of the parapets on both sides of the carriageway (12m^2)	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Footways to be swept and cleaned including the removal of vegetation from the base of the parapet (10m^2)	Screened out - works within the bridge deck and therefore no pathway.
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed. Vegetation mostly consists of bushes (8m^2)	Screened in - this activity could result in the exposure of loose soils, resulting in a sediment load to the river.
Embankments/ Revetments	Undermined concrete apron of SE embankment needs to be repaired (1m^2)	Screened in – instream repair work required with surface water connectivity to SAC.
Wing/ Spandrel/ Retaining Walls	Minor masonry repointing to wing walls (6m^2)	Screened in – use of wet mortar over water and therefore a surface water pathway is present.
Wing/ Spandrel/ Retaining Walls	There is a partial collapse of SE masonry wall which requires repair (0.5m^3)	Screened in – use of wet mortar over water and therefore a surface water pathway is present.
Riverbed	Major obstruction under structure, steel gate to be removed. (Expected: 1m^2) Vegetation to be removed from under structure. Mostly grass. (Expected 3m^2)	Screened in - although this bridge is outside the SAC, this work element is screened in due to risk of silt release and a surface water connectivity to the SAC.
Riverbed	There is a partial collapse of the downstream riverbed apron of span 3, partial collapse measures 1.4m length x 3.2m wide x 0.4m high, damage located 1.2m from pier 2. Riverbed apron also to be repaired.	Screened in.
Structure in general	1 no. ID plate missing.	Screened out - works within the bridge deck and therefore no pathway.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Clearance of watercourse (Debris Removal)

Vegetation debris and waste debris shall only be removed from watercourses by hand. As per the Works Requirements Specification document, no live aquatic vegetation or silt shall be removed from the riverbed. Where there is any doubt the Contractor must seek the advice of their appointed ecologist. Care is to be taken not to disturb the riverbed when removing debris from the watercourse in order to minimise any disturbance of silt.

For large areas of debris removal, such as fallen trees, any plant or machinery used in the removal process shall not be permitted to enter the watercourse. In such cases where there is a risk that large areas of silt have accumulated behind an obstruction, which could be released by its removal, these must be considered on a case by case basis and advice of the Contractor's ecologist must be sought. Where there is a risk of significant silt release, which would result in a plume similar to that of Category 3 'A Lot of visible Silt' (NS2, 2009), appropriate measures to contain such silt shall be placed downstream of the works area prior to the commencement of works.

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a

long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement.

For the removal of the gate, all debris caught in and around the frame of the gate should first be removed by hand. The presence of silt accumulation behind the gate should be assessed as described above, and if necessary, silt containment measures installed. For the removal of the gate from the channel, machinery shall not enter the river channel.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

Scour Repairs

All scour protection works will be done in the dry by placing and compacting mass concrete in any scour void less than 300mm depth and 300mm width provided immediately in front of the affected area over a length and width specified in the Work Order for that bridge.

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

The Contractor must notify Inland Fisheries Ireland prior to the commencement of the proposed instream works and the associated mitigation measures outlined above must be implemented. The Contractor's ecologist will advise on whether translocation of crayfish or electrofishing to remove fish from between the upstream and downstream sandbags is required. Where both translocation of crayfish and electrofishing are required, the translocation of crayfish shall be carried out prior to electrofishing. Where dewatering activities occur, instream silts should not be disturbed or removed from the river channel. If disturbance and/or removal of silts is required to access a bridge component, the silts shall be surveyed for the presence of lamprey ammocoetes. If lamprey ammocoetes are found, they shall be translocated to suitable receptor habitats. Receptor habitats shall be selected prior to lamprey removal from the silts. All surveying and electrofishing activities of protected species, i.e. crayfish, lamprey and salmonids, shall be carried out under licence.

Maintenance of slope protection

Maintenance of slope protection will be carried out in the dry by repairing/replacing existing slope protection with similar material used in the slope protection onsite including; paving slabs, masonry and concrete. Where concrete slope protect requires repair compacted mass concrete will be place in scour voids and immediately in front of the affected areas over a length and width specified in the Work Order for that bridge.

No concrete, cementitious or fine partial material will be permitted to enter the watercourse. This will be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. One span/culvert structures may not have sufficient capacity accommodate the required working area for a localised diversion. In this instance fluming of the entire waterbody will be carried out in line with Inland Fisheries Ireland, 2016 *Guidelines*

on protection of fisheries during construction works in and adjacent to water. The waterbodies will be diverted from upstream to downstream of the works area by means of a secure open flume arrangement, or through piping, or in limited circumstances, by means of over pumping. If over pumping is required, a second pump shall be available on site in case of failure of the primary pump.

The Contractor's ecologist will specify the required area to be diverted and if the stream is diverted using sand bags or flumed entirely, the ecologist will oversee fluming of the waterbody.

Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

The Contractor must notify Inland Fisheries Ireland prior to the commencement of any proposed instream works and the associated mitigation measures outlined above must be implemented. The Contractor's ecologist will advise on whether translocation of crayfish or electrofishing to remove fish from between the upstream and downstream sandbags is required. Where both translocation of crayfish and electrofishing are required, the translocation of crayfish shall be carried out prior to electrofishing. Where dewatering activities occur, instream silts should not be disturbed or removed from the river channel. If disturbance and/or removal of silts is required to access a bridge component, the silts shall be surveyed for the presence of lamprey ammocoetes. If lamprey ammocoetes are found, they shall be translocated to suitable receptor habitats. Receptor habitats shall be selected prior to lamprey removal from the silts. All surveying and electrofishing activities of protected species, i.e. crayfish, lamprey and salmonids, shall be carried out under licence.

Masonry Repointing / Masonry Repairs

In some locations repointing over water will be possible on foot; where the mason cannot reach the area of repointing from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the repointing work will include vegetation removal; loose and cracked pointing shall be raked out to sound material and the joint cleaned by hand. The joints will then be dampened, and mortar will be pointed flush with the masonry face. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of mortar shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no lime mortar or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste mortar entering the watercourse. Once the area has been repointed and brushed back to the desired finish the geotextile will be carefully removed and the waste mortar will be removed off-site and disposed of appropriately at an approved site.

Note: *The same principles apply to concrete works over water.*

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the River Moy SAC or any other European site.

5.8.5.2. Rahans Bridge [MO-N26-001.00]

The original bridge is a 3.65m single span masonry arch structure. It has been extended by a 1.88m wide masonry arch on the west side and a 1.82m masonry arch on the east side which is extended further by a 2.55m wide corrugated steel arch and a 900mm wide concrete arch. There are masonry parapets on both sides of the carriageway. The structure is located 450m upstream of the River Moy SAC. Plate 5-17 shows the east elevation.

Plate 5-17 Rahans Bridge.

The qualifying interests of the River Moy SAC are listed in Section 5.2. The qualifying interests that could be impacted are crayfish, lamprey species, salmon and otter. The potential impacts to the SAC are the loss or modification of habitat, deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-27 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-27 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	Cracks are present in pavement which should be repaired (2m)	Screened out - works within the bridge deck and therefore no pathway.
Bridge surface	1m strip either side of carriageway to be swept and cleaned including the removal of vegetation from the kerbstone (10m^2)	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	There is an area of cracking on the east footway which should be repaired.	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Footways to be swept and cleaned including the removal of vegetation from the base of the parapet (10m^2)	Screened out - works within the bridge deck and therefore no pathway.
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed. Vegetation mostly consists of bushes (24m^2)	Screened in - this activity could result in the exposure of loose soils, resulting in a sediment load to the river.
Deck/ Slab/ Arch barrel	There are 2 no. of spalled areas with corroded rebar that need to be repaired. Rebar should be fully exposed, cleaned and painted with anti-corrosion paint prior to concrete repair (2m^2)	Screened in – concrete repair works have the potential to impact on surface water quality through accidental spillage.
Riverbed	Debris and vegetation under and within 5m structure to be removed (5m^2)	Screened in.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Clearance of watercourse (Debris Removal)

Vegetation debris and waste debris shall only be removed from watercourses by hand. As per the Works Requirements Specification document, no live aquatic vegetation or silt shall be removed from the riverbed. Where there is any doubt the Contractor must seek the advice of their appointed ecologist. Care is to be taken not to disturb the riverbed when removing debris from the watercourse in order to minimise any disturbance of silt.

For large areas of debris removal, such as fallen trees, any plant or machinery used in the removal process shall not be permitted to enter the watercourse. In such cases where there is a risk that large areas of silt have accumulated behind an obstruction, which could be released by its removal, these must be considered on a case by case basis and advice of the Contractor's ecologist must be sought. Where there is a risk of significant silt release, which would result in a plume similar to that of Category 3 'A Lot of visible Silt' (NS2, 2009), appropriate measures to contain such silt shall be placed downstream of the works area prior to the commencement of works.

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

Concrete Repairs

Where personnel cannot reach the works area from the ground, work platforms (scaffolds, ladders, and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the concrete works may include vegetation removal. Loose and cracked material shall be raked out to sound material and the area cleaned by hand. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of materials shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no material or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste material entering the watercourse. Once the area has been repaired and brushed back to the desired finish, the geotextile will be carefully removed and the waste material will be removed off-site and disposed of appropriately at an approved site.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the River Moy SAC or any other European site.

5.8.5.3. Coolcronaun Bridge [MO-N26-003.00]

The Coolcronaun Bridge is a 2-span masonry arch bridge with 1.56m span each. The rise of arch barrel at crown is 0.41m. There are masonry parapets on both sides of the carriageway. The structure is located 1.3km upstream of the River Moy SAC. Plate 5-18 shows the east elevation.

Plate 5-18 Coolcronaun Bridge.

The qualifying interests of the River Moy SAC are listed in Section 5.2. The qualifying interests that could be impacted are crayfish, lamprey species, salmon and otter. The potential impacts to the SAC are the deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-28 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-28 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m strip either side of carriageway to be swept and cleaned including the removal of vegetation from the kerbstone ($12m^2$)	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	1m strip along both parapets to be swept and cleaned including the removal of vegetation from the base of the parapet ($12m^2$)	Screened out - works within the bridge deck and therefore no pathway.
Parapets/ Safety barrier	Masonry to be repointed where vegetation was removed ($2m^2$)	Screened in – use of wet mortar over water and therefore a surface water pathway is present.
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed. Vegetation mostly consists of bushes ($8m^2$)	Screened in - this activity could result in the exposure of loose soils, resulting in a sediment load to the river.
Abutments	There is mortar washout throughout and local missing masonry measuring 200mm high x 100mm wide x 200mm deep at the north abutment in span 1 which should be reinstated.	Screened in – use of wet mortar over water and therefore a surface water pathway is present.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

Masonry Repairs

In some locations repointing over water will be possible on foot; where the mason cannot reach the area of repointing from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the repointing work will include vegetation removal; loose and cracked pointing shall be raked out to sound material and the joint cleaned by hand. The joints will then be dampened, and mortar will be pointed flush with the masonry face. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of mortar shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no lime mortar or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste mortar entering the watercourse. Once the area has been repointed and brushed back to the desired finish the geotextile will be carefully removed and the waste mortar will be removed off-site and disposed of appropriately at an approved site.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works

proposed at this bridge will not result in adverse effects on the River Moy SAC or any other European site.

5.8.5.4. Carrick Bridge [MO-N26-007.00]

The Carrick Bridge is a 3.35m single span masonry arch bridge with masonry parapets on both sides of the carriageway. The rise of arch barrel at crown is 1.22m. The structure carries N26 over the Carrow Loughs stream. The structure is located 2.4km upstream of the River Moy SAC. Plate 5-19 shows the east elevation.

Plate 5-19 Carrick Bridge.

The qualifying interests of the River Moy SAC are listed in Section 5.2. The qualifying interests that could be impacted are crayfish, lamprey species, salmon and otter. The potential impacts to the SAC are the loss or modification of habitat, deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-29 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-29 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m strip either side of carriageway to be swept and cleaned including the removal of vegetation from the kerbstone (16m^2)	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Reseal construction joint in the east raised verge.	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Footways to be swept and cleaned including the removal of vegetation from the base of the parapet (32m^2)	Screened out - works within the bridge deck and therefore no pathway.
Wing/ Spandrel/ Retaining Walls	Minor vegetation removal required from both sides (15m^2)	Screened out - removal of vegetation may require instream access of the erection of scaffolding, however this will not affect the qualifying interests of the SAC located downstream of the bridge.

Bridge Component	Work Element	Screening Recommendation
Riverbed	Debris and vegetation under and within 5m of structure to be removed (20m^2)	Screened in - although this bridge is outside the SAC, this work element is screened in due to risk of silt release and a surface water connectivity to the SAC.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Clearance of watercourse (Debris Removal)

Vegetation debris and waste debris shall only be removed from watercourses by hand. As per the Works Requirements Specification document, no live aquatic vegetation or silt shall be removed from the riverbed. Where there is any doubt the Contractor must seek the advice of their appointed ecologist. Care is to be taken not to disturb the riverbed when removing debris from the watercourse in order to minimise any disturbance of silt.

For large areas of debris removal, such as fallen trees, any plant or machinery used in the removal process shall not be permitted to enter the watercourse. In such cases where there is a risk that large areas of silt have accumulated behind an obstruction, which could be released by its removal, these must be considered on a case by case basis and advice of the Contractor's ecologist must be sought. Where there is a risk of significant silt release, which would result in a plume similar to that of Category 3 'A Lot of visible Silt' (NS2, 2009), appropriate measures to contain such silt shall be placed downstream of the works area prior to the commencement of works.

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the River Moy SAC or any other European site.

5.8.5.5. Knockadangan Bridge [MO-N59-003.00]

The Knockadangan Bridge is a 3-span reinforced concrete bridge carries N59 over the River Deel. The maximum span is 11.04m and the minimum span is 10.20m. There are 24 pre-stressed precast beams in each span of the structure. There are drainage tubes through the deck in the western span. The structure is within the River Moy SAC and located 4.8km upstream of the Lough Conn and Lough Cullin SPA. Plate 5-20 shows the north elevation.

Plate 5-20 Knockadangan Bridge.

The qualifying interests of the River Moy SAC and Lough Conn and Lough Cullin SPA are listed in Section 5.2. The qualifying interests that could be impacted are crayfish, lamprey species, salmon and otter. The potential impacts to the SAC are deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-30 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-30 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m strip either side of carriageway to be swept and cleaned including the removal of vegetation from the kerbstone (87m^2)	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	1m strip along both parapets to be swept and cleaned including the removal of vegetation from the base of the parapet (87m^2)	Screened out - works within the bridge deck and therefore no pathway.
Parapets/ Safety barrier	Parapets to be high pressure hosed. Total and expected area is 70m^2.	Screened in.
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed. Vegetation mostly consists of bushes.	Screened in.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

High-pressure hosing of surface

High pressure water hosing will be used to remove moss/algae/lichen from metal parapets. Water from any adjacent watercourse if present is not to be used for the works; potable freshwater from a public utility undertaking will be brought to site for use in the works. No chemicals are to be added to the water supply used in the hosing works. The use of hot water is prohibited.

Due consideration must be given to run-off and the risk of contaminates removed from the surface entering water courses or affecting the surrounding flora and fauna. The Contractor shall ensure any waste materials from the works are collected and disposed of correctly. In Natura 2000 sites only soft washing (<500psi) of metal parapets is allowed. If the bridge drainage at these sites leads directly into the watercourse, the outfall of all gullies on the bridge must be blocked during works and the gullies must be sucked out following the power hosing to ensure the water and waste material does not reach the watercourse.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the River Moy SAC and Lough Conn and Lough Cullin SPA or any other European site.

5.8.5.6. Coolturk Bridge [MO-N59-006.00]

The structure is a 3.04m diameter corrugated steel pipe culvert with masonry parapets on both sides of the carriageway. The structure is located 3km upstream of the River Moy SAC. Plate 5-21 shows the south elevation.

Plate 5-21 Coolturk Bridge.

The qualifying interests of the River Moy SAC are listed in Section 5.2. The qualifying interests that could be impacted are crayfish, lamprey species, salmon and otter. The potential impacts to the SAC are deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-31 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-31 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m strip along both parapets to be swept and cleaned including the removal of vegetation from the base of the parapet (32m^2)	Screened out - works within the bridge deck and therefore no pathway.
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed. Vegetation mostly consists of bushes (40m^2)	Screened out -site visit carried out at structure; vegetation not consistent with SAC and works will be carried out from the bank. Given the nature and scale of the proposed works, LSE are not anticipated.
Embankments/ Revetments	Concrete rock armour undermined in south west embankment (0.4m^2)	Screened in – concrete repair works with surface water pathway present.
Wing/ Spandrel/ Retaining Walls	Loss on concrete at interface with corrugated pipe (0.1m^2)	Screened in – concrete repair works with surface water pathway present.

Mitigation Measures

The following mitigation measures apply to the works elements that ‘screened-in’ in order to avoid adverse effects to a Natura 2000 site.

Maintenance of slope protection

Maintenance of slope protection will be carried out in the dry by repairing/replacing existing slope protection with similar material used in the slope protection onsite including; paving slabs, masonry and concrete. Where concrete slope protect requires repair compacted mass concrete will be place in scour voids and immediately in front of the affected areas over a length and width specified in the Work Order for that bridge.

No concrete, cementitious or fine partial material will be permitted to enter the watercourse. This will be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. One span/culvert structures may not have sufficient capacity accommodate the required working area for a localised diversion. In this instance fluming of the entire waterbody will be carried out in line with Inland Fisheries Ireland, 2016 Guidelines on protection of fisheries during construction works in and adjacent to water. The waterbodies will be diverted from upstream to downstream of the works area by means of a secure open flume arrangement, or through piping, or in limited circumstances, by means of over pumping. If a pump system is used, a backup pump will be available on site in case of failure of the primary pump.

The Contractor's ecologist will specify the required area to be diverted and if the stream is diverted using sand bags or flumed entirely, the ecologist will oversee fluming of the waterbody.

Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

The Contractor must notify Inland Fisheries Ireland prior to the commencement of any proposed instream works and the associated mitigation measures outlined above must be implemented. The Contractor's ecologist will advise on whether translocation of crayfish or electrofishing to remove fish from between the upstream and downstream sandbags is required. Where both translocation of crayfish and electrofishing are required, the translocation of crayfish shall be carried out prior to electrofishing. Where dewatering activities occur, instream silts should not be disturbed or removed from the river channel. If disturbance and/or removal of silts is required to access a bridge component, the silts shall be surveyed for the presence of lamprey ammocoetes. If lamprey ammocoetes are found, they shall be translocated to suitable receptor habitats. Receptor habitats shall be selected prior to lamprey removal from the silts. All surveying and electrofishing activities of protected species, i.e. crayfish, lamprey and salmonids, shall be carried out under licence.

Concrete Repairs

Where personnel cannot reach the works area from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the concrete works may include vegetation removal. Loose and cracked material shall be raked out to sound material and the area cleaned by hand. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of materials shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great

care is to be taken to ensure that no material or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste material entering the watercourse. Once the area has been repaired and brushed back to the desired finish, the geotextile will be carefully removed and the waste material will be removed off-site and disposed of appropriately at an approved site.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the River Moy SAC or any other European site.

5.8.5.7. Eskeragh Bridge [MO-N59-008.00]

The Eskeragh Bridge is a 4.08m single span in-situ reinforced concrete bridge which carries N59 over the Fiddaunatooghaun stream. There are steel safety barriers before the aluminium railing parapets on both sides of the carriageway.

The structure is on the boundary of the Bellacorick Bog Complex SAC and the Fiddaunatooghaun stream flows through the SAC. The Fiddaunatooghaun stream flows into the Shavolahan River, which is a tributary of the River Deel. The lower reaches of the River Shavolahan River and the River Deel are within the River Moy SAC. Plate 5-22 shows the south elevation.

Plate 5-22 Eskeragh Bridge.

The qualifying interests of the Bellacorick Bog Complex SAC and River Moy SAC are listed in Section 5.2. The qualifying interests that could be impacted are crayfish, lamprey species, salmon and otter. The potential impacts to the SAC are deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-32 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-32 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	Rubbing strips to be swept and cleaned (48m^2)	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Footways to be swept and cleaned including the removal of vegetation (30m^2)	Screened out - works within the bridge deck and therefore no pathway.
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed. Vegetation mostly consists of grass (60m^2)	Screened out - vegetation removal involves cutting of grass covered embankments, which is not a component of habitats designated under the SAC. LSE not anticipated.
Abutments	Areas of water staining to be cleaned (20m^2)	Screened in.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

High-pressure hosing of surface

High pressure water hosing will be used to remove moss/algae/lichen from metal parapets. Water from any adjacent watercourse if present is not to be used for the works; potable freshwater from a public utility undertaking will be brought to site for use in the works. No chemicals are to be added to the water supply used in the hosing works. The use of hot water is prohibited.

Due consideration must be given to run-off and the risk of contaminates removed from the surface entering water courses or affecting the surrounding flora and fauna. The Contractor shall ensure any waste materials from the works are collected and disposed of correctly. In Natura 2000 sites or sites with freshwater pearl mussels are present, only soft washing (<500psi) of metal parapets is allowed. If the bridge drainage at these sites leads directly into the watercourse, the outfall of all gullies on the bridge must be blocked during works and the gullies must be sucked out following the power hosing to ensure the water and waste material does not reach the watercourse.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the Bellacorick Bog Complex SAC and River Moy SAC or any other European site.

5.8.5.8. Lagduff Bridge [MO-N59-026.00]

The structure is a 2.43m single span masonry arch bridge with masonry parapets on both sides of the carriageway. The rise of arch barrel at crown is 1.21m. The structure lies on the boundary of the Owenduff/Nephin Complex SAC and the Owenduff/Nephin Complex SPA. This SPA and SAC are predominantly a SAC and SPA that cover the mountain range to the east of the N59. Lagduff Bridge lies on the boundary line of the SAC and SPA.

The bridge spans on a small unnamed stream that flows into Tullaghan Bay. Tullaghan Bay is encompassed by Blacksod Bay/Broadhaven SPA. Therefore, the bridge has surface water connectivity to Blacksod Bay/ Broadhaven SPA. Plate 5-23 shows the east elevation.

Plate 5-23 Lagduff Bridge.

The qualifying interests of the Owenduff/Nephin Complex SAC, Owenduff/Nephin Complex SPA and Blacksod Bay/ Broadhaven SPA are listed in Section 5.2. As outlined above, the bridge is on the boundary line of the Owenduff/Nephin SAC and SPA, however has surface water connectivity to Blacksod Bay/ Broadhaven SPA. Thus, given the geographic location of the bridge, flow direction of the river and nature of connectivity, the qualifying interests that could be impacted are the designated bird species of the Blacksod Bay/ Broadhaven SPA using Tullaghan Bay, which is located approximately 3.4km downstream of the bridge. The potential impacts to the SPA are deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-33 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-33 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m strip along both parapets to be swept and cleaned including the removal of vegetation from the base of the parapet (10m^2)	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Footways to be swept and cleaned including the removal of vegetation (12m^2)	Screened out - works within the bridge deck and therefore no pathway.

Bridge Component	Work Element	Screening Recommendation
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed. Vegetation mostly consists of bushes (32m^2)	Screened in - this activity could result in the exposure of loose soils, resulting in a sediment load to the river.
Abutments	Vegetation to be removed from abutments (3m^2)	Screened out - due to nature and scale of proposed works, no LSE anticipated. Any instream access by personnel required to remove the vegetation will not impact qualifying interests of a European site.
Abutments	Masonry to be repointed where vegetation was removed (3m^2)	Screened in – use of wet mortar over water and therefore a surface water pathway is present.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

Masonry Repointing

In some locations repointing over water will be possible on foot; where the mason cannot reach the area of repointing from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the repointing work will include vegetation removal; loose and cracked pointing shall be raked out to sound material and the joint cleaned by hand. The joints will then be dampened, and mortar will be pointed flush with the masonry face. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of mortar shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no lime mortar or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste mortar

entering the watercourse. Once the area has been repointed and brushed back to the desired finish the geotextile will be carefully removed and the waste mortar will be removed off-site and disposed of appropriately at an approved site.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the Blacksod Bay/ Broadhaven SPA or any other European site.

5.8.5.9. Burrishoole Bridge [MO-N59-042.00]

The Burrishoole Bridge is a 3-span reinforced concrete bridge with aluminium railing parapets on both sides of the carriageway. The deck consists of 6 No. pre-stressed spaced beams with a reinforced concrete deck slab. The maximum span is 15.45m and the minimum span is 15.27m. The structure is within the Clew Bay Complex SAC. Plate 5-24 shows the south elevation.

Plate 5-24 Burrishoole Bridge.

The qualifying interests of the Clew Bay Complex SAC are listed in Section 5.2. The qualifying interests that could be impacted are large shallow inlets and bays and otter. The potential impacts to the SAC are deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-34 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-34 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m strip either side of carriageway to be swept and cleaned including the removal of vegetation from the base of the parapet (90m^2)	Screened out - works within the bridge deck and therefore no pathway.
Expansion joints	There is de-bonded polysulphide seal behind and under beam on the west side which should be repaired	Screened out - works within the bridge deck and therefore no pathway.
Parapets/ Safety barrier	High pressure hosing of parapets required for a total of 110m^2.	Screened in.
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed (170m^2)	Screened in.
Wing/ Spandrel/ Retaining Walls	The southeast and north east embankment walls require repointing (4m^2)	Screened in – use of wet mortar over water.
Wing/ Spandrel/ Retaining Walls	North west embankment wall has loss of masonry which should be repaired	Screened in – use of wet mortar over water.
Piers	There is mortar loss in the west face of the west pier and the north end of the east pier. Repointing should be carried out. (7m^2)	Screened in – use of wet mortar over water.
Riverbed	Debris and vegetation under and within 5m of structure to be removed. Boat required (10m^2)	Screened in.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Clearance of watercourse (Debris Removal)

The work order states that a boat is required for access for the removal of debris and vegetation from the channel under and within 5m of the structure.

Vegetation debris and waste debris shall only be removed from watercourses by hand. As per the Works Requirements Specification document, no live aquatic vegetation or silt shall be removed from the riverbed. Where there is any doubt the Contractor must seek the advice of their appointed ecologist. Care is to be taken not to disturb the riverbed when removing debris from the watercourse in order to minimise any disturbance of silt.

For large areas of debris removal, such as fallen trees, any plant or machinery used in the removal process shall not be permitted to enter the watercourse. In such cases where there is a risk that large areas of silt have accumulated behind an obstruction, which could be released by its removal, these must be considered on a case by case basis and advice of the Contractor's ecologist must be sought. Where there is a risk of significant silt release, which would result in a plume similar to that of Category 3 'A Lot of visible Silt' (NS2, 2009), appropriate measures to contain such silt shall be placed downstream of the works area prior to the commencement of works.

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

High-pressure hosing of surface

High pressure water hosing will be used to remove moss/algae/lichen from metal parapets. Water from any adjacent watercourse if present is not to be used for the works; potable freshwater from a public utility undertaking will be brought to site for use in the works. No chemicals are to be added to the water supply used in the hosing works. The use of hot water is prohibited.

Due consideration must be given to run-off and the risk of contaminates removed from the surface entering water courses or affecting the surrounding flora and fauna. The Contractor shall ensure any waste materials from the works are collected and disposed of correctly. In Natura 2000 sites only soft washing (<500psi) of metal parapets is allowed. If the bridge drainage at these sites leads directly into the watercourse, the outfall of all gullies on the bridge must be blocked during works and the gullies must be sucked out following the power hosing to ensure the water and waste material does not reach the watercourse.

Masonry Repointing / Masonry Repairs

In some locations repointing over water will be possible on foot; where the mason cannot reach the area of repointing from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the repointing work will include vegetation removal; loose and cracked pointing shall be raked out to sound material and the joint cleaned by hand. The joints will then be dampened, and mortar will be pointed flush with the masonry face. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of mortar shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no lime mortar or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste mortar entering the watercourse. Once the area has been repointed and brushed back to the desired finish the geotextile will be carefully removed and the waste mortar will be removed off-site and disposed of appropriately at an approved site.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the Clew Bay Complex SAC or any other European site.

5.8.5.10. Gowlan Bridge [MO-N59-063.00]

The structure is a 4.02m single span masonry arch bridge with masonry parapets on both sides of the carriageway. The rise of arch barrel at crown is 0.85m. The structure is approximately 50m upstream of the Mweelrea/Sheeffry/Erriff Complex SAC. Plate 5-25 shows the east elevation.

Plate 5-25 Gowlan Bridge.

The qualifying interests of the Mweelrea/Sheeffry/Erriff Complex SAC are listed in Section 5.2. The qualifying interests that could be impacted are freshwater pearl mussel, salmon, otter and floating river vegetation habitat. The potential impacts to the SAC are the deterioration of surface water quality and reduction in species density.

There are no records for freshwater pearl mussel at the bridge. [redacted]

Proposed Works

The proposed works at this bridge are detailed in Table 5-35 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-35 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m strip on both sides of carriageway to be swept and cleaned including the removal of vegetation from the base of the parapet (14m^2)	Screened out - works within the bridge deck and therefore no pathway.
Parapets/ Safety barrier	Vegetation to be removed from parapet. 1.5m^2 roadside and 1.5m^2 riverside	Screened out – removal of vegetation may require instream access or the erection of scaffolding, however this will not impact the qualifying interests of the downstream SAC.
Parapets/ Safety barrier	Masonry to be repointed where vegetation was removed and where mortar has eroded (5m^2)	Screened in – use of wet mortar over water.
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed. Vegetation mostly consists of grass (12m^2)	Screened in - this activity could result in the exposure of loose soils, resulting in a sediment load to the river.
Wing/ Spandrel/ Retaining Walls	Vegetation to be removed from both wingwalls (3m^2)	Screened out – removal of vegetation may require instream access or the erection of scaffolding, however this will not impact the qualifying interests of the downstream SAC.
Wing/ Spandrel/ Retaining Walls	Masonry to be repointed where vegetation was removed (5m^2)	Screened in – use of wet mortar potentially over water.
Abutments	Vegetation to be removed from abutments (1m^2)	Screened out – removal of vegetation may require instream access or the erection of scaffolding, however this will not impact the qualifying interests of the downstream SAC.
Abutments	Masonry to be repointed where vegetation was removed (2m^2)	Screened in – use of wet mortar over water.
Riverbed	Undermining to the scour protection wall to be repaired (1m^2)	Screened in.
Other elements	Fence downstream of structure to be removed.	Screened in – will require instream access and risk of silt release present.
Structure in general	Bridge ID to be replaced (1 no.)	Screened out - works within the bridge deck and therefore no pathway.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Clearance of watercourse (Debris Removal)

Vegetation debris and waste debris shall only be removed from watercourses by hand. As per the Works Requirements Specification document, no live aquatic vegetation or silt shall be removed from the riverbed. Where there is any doubt the Contractor must seek the advice of their appointed ecologist. Care is to be taken not to disturb the riverbed when removing debris from the watercourse in order to minimise any disturbance of silt.

For large areas of debris removal, such as fallen trees, any plant or machinery used in the removal process shall not be permitted to enter the watercourse. In such cases where there is a risk that large areas of silt have accumulated behind an obstruction, which could be released by its removal, these must be considered on a case by case basis and advice of the Contractor's ecologist must be sought. Where there is a risk of significant silt release, which would result in a plume similar to that of Category 3 'A Lot of visible Silt' (NS2, 2009), appropriate measures to contain such silt shall be placed downstream of the works area prior to the commencement of works.

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement.

For the removal of the fence downstream of the bridge, all debris caught in and around the fencing and posts should first be removed by hand. The presence of silt accumulation should be assessed as described above, and if necessary, silt containment measures installed. If machinery is required for the removal of the fence from the channel, the machinery shall not enter the river channel.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

Scour Repairs

All scour protection works will be done in the dry by placing and compacting mass concrete in any scour void less than 300mm depth and 300mm width provided immediately in front of the affected area over a length and width specified in the Work Order for that bridge.

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

The Contractor must notify Inland Fisheries Ireland prior to the commencement of the proposed instream works and the associated mitigation measures outlined above must be implemented. The Contractor's ecologist will advise on whether translocation of crayfish or electrofishing to remove fish from between the upstream and downstream sandbags is required. Where both translocation of crayfish and electrofishing are required, the translocation of crayfish shall be carried out prior to electrofishing. Where dewatering activities occur, instream silts should not be disturbed or removed from the river channel. If disturbance and/or removal of silts is required to access a bridge component, the silts shall be surveyed for the presence of lamprey ammocoetes. If lamprey ammocoetes are found, they shall be translocated to suitable receptor habitats. Receptor habitats shall be selected prior to lamprey removal from the silts. All surveying and electrofishing activities of protected species, i.e. crayfish, lamprey and salmonids, shall be carried out under licence.

Masonry Repointing

In some locations repointing over water will be possible on foot; where the mason cannot reach the area of repointing from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the repointing work will include vegetation removal; loose and cracked pointing shall be raked out to sound material and the joint cleaned by hand. The joints will then be dampened, and mortar will be pointed flush with the masonry face. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of mortar shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no lime mortar or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste mortar entering the watercourse. Once the area has been repointed and brushed back to the desired finish the geotextile will be carefully removed and the waste mortar will be removed off-site and disposed of appropriately at an approved site.

Note: *The same principles apply to concrete works over water.*

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the Mweelrea/Sheeffry/Erriff Complex SAC or any other European site.

5.8.5.11. Glenacally Bridge [MO-N59-066.00]

The structure is a 9.05m single span masonry arch bridge with masonry parapets on both sides of the carriageway. The rise of arch barrel at crown is 4.8m. Bridge spans a tributary of the Erriff River. The structure is within the Mweelrea/Sheeffry/Erriff Complex SAC. Plate 5-26 shows the south elevation.

Plate 5-26 Glenacally Bridge.

The qualifying interests of the Mweelrea/Sheeffry/Erriff Complex SAC are listed in Section 5.2. The qualifying interests that could be impacted are freshwater pearl mussel, salmon, otter and floating river vegetation habitat. The potential impacts to the SAC are the physical disturbance of species, deterioration of surface water quality and reduction in species density.

There are no records for freshwater pearl mussel at the bridge. [redacted]

Proposed Works

The proposed works at this bridge are detailed in Table 5-36 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-36 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m strip either side of carriageway to be swept and cleaned including the removal of vegetation from the base of the parapet (40m^2)	Screened out - works within the bridge deck and therefore no pathway.
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed (20m^2)	Screened in - this activity could result in the exposure of loose soils, resulting in a sediment load to the river.
Wing/ Spandrel/ Retaining Walls	Vegetation to be removed from wing and spandrel walls (5m^2)	Screened in – removal of vegetation may require instream access or the erection of scaffolding.
Wing/ Spandrel/ Retaining Walls	Masonry to be repointed where vegetation was removed (5m^2)	Screened in – use of wet mortar over water.

Bridge Component	Work Element	Screening Recommendation
Deck/ Slab/ Arch barrel	Deck to be repainted in areas where mortar loss has occurred (15m^2)	Screened in – use of wet mortar over water.
Structure in general	Maintenance of structure ID (1 no.)	Screened out - works within the bridge deck and therefore no pathway.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments or from the bridge where freshwater pearl mussel is situated within the immediate vicinity of the embankments and/ or bridge. As per the requirements of the Contract, *if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area*.

Masonry Repointing

In some locations repointing over water will be possible on foot; where the mason cannot reach the area of repointing from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream.

Preparation for the repointing work will include vegetation removal; loose and cracked pointing shall be raked out to sound material and the joint cleaned by hand. The joints will then be dampened, and mortar will be pointed flush with the masonry face. In the event of poor/unforeseen weather polythene or hessian covers shall be used to protect the work until the work has time to cure.

Mixing of mortar shall be carried out at least 25 metres away from the riverbank, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no lime mortar or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste mortar entering the watercourse. Once the area has been repointed and brushed back to the desired finish the geotextile will be carefully removed and the waste mortar will be removed off-site and disposed of appropriately at an approved site.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the Mweelrea/Sheeffry/Erriff Complex SAC or any other European site.

5.8.5.12. Manulla Bridge [MO-N60-002.00]

The Manulla Bridge is a 9.12m single span reinforced concrete bridge with in-situ reinforced concrete extension. There are aluminium railing parapets on both sides of the carriageway. The structure is within the River Moy SAC. Plate 5-27 shows the north elevation.

Plate 5-27 Manulla Bridge.

The qualifying interests of the River Moy SAC are listed in Section 5.2. The qualifying interests that could be impacted are crayfish, lamprey species, salmon and otter. The potential impacts to the SAC are deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-37 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-37 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m strip along both sides of the carriageway to be swept and cleaned ($24m^2$)	Screened out - works within the bridge deck and therefore no pathway.
Footways/ Median	Rubbing strip to be installed on both side of carriageway. Dimensions are 14mx1.5m north and 14mx0.5m south	Screened out - works within the bridge deck and therefore no pathway.
Parapets/ Safety barrier	High pressure hosing of both parapets. Total area $40m^2$	Screened in.
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed. Vegetation mostly consists of grass ($10m^2$)	Screened out. Vegetation removal involves cutting of grass on embankments, which is not a designated habitat of the SAC. No LSE anticipated.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

High-pressure hosing of surface

High pressure water hosing will be used to remove moss/algae/lichen from metal parapets. Water from any adjacent watercourse if present is not to be used for the works; potable freshwater from a public utility undertaking will be brought to site for use in the works. No chemicals are to be added to the water supply used in the hosing works. The use of hot water is prohibited.

Due consideration must be given to run-off and the risk of contaminates removed from the surface entering water courses or affecting the surrounding flora and fauna. The Contractor shall ensure any waste materials from the works are collected and disposed of correctly. In Natura 2000 sites or sites with freshwater pearl mussels are present, only soft washing (<500psi) of metal parapets is allowed. If the bridge drainage at these sites leads directly into the watercourse, the outfall of all gullies on the bridge must be blocked during works and the gullies must be sucked out following the power hosing to ensure the water and waste material does not reach the watercourse.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the River Moy SAC or any other European site.

5.8.5.13. Keel Bridge [MO-N84-005.00]

The Keel Bridge is a 11.55m single span steel and concrete composite bridge. There are masonry parapets on both sides of the carriageway. The structure is within the Lough Carra/Mask Complex SAC and Lough Carra SPA. Plate 5-28 shows the east elevation.

Plate 5-28 Keel Bridge.

The qualifying interests of the Lough Carra/Mask Complex SAC and Lough Carra SPA are listed in Section 5.2. The qualifying interests that could be impacted are oligotrophic/ oligotrophic to mesotrophic/ hard oligo-mesotrophic waters, and otter. The potential impacts to the SAC are deterioration of surface water quality and reduction in species density.

Proposed Works

The proposed works at this bridge are detailed in Table 5-38 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

Table 5-38 - Work elements and potential for likely significant effects.

Bridge Component	Work Element	Screening Recommendation
Bridge surface	1m strip along both parapets to be swept and cleaned including the removal of vegetation from the base of the parapet (14m^2)	Screened out - works within the bridge deck and therefore no pathway.
Parapets/ Safety barrier	Parapet to be high pressure hosed. Total area 15m^2	Screened in.
Embankments/ Revetments	Vegetation up to 1m from the structure to be cut back or removed (20m^2)	Screened in.

Mitigation Measures

The following mitigation measures apply to the works elements that 'screened-in' in order to avoid adverse effects to a Natura 2000 site.

Removal of vegetation

As per the Work Requirements Specification document, all vegetation removal on embankments shall involve the removal of vegetation down to ground level. There shall be no digging or grubbing out of

vegetation and remaining stumps on the embankments or activities that would result in exposed and loose soils.

Instream access is not permitted for the intention of vegetation removal from embankments. As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area.

High-pressure hosing of surface

High pressure water hosing will be used to remove moss/algae/lichen from metal parapets. Water from any adjacent watercourse if present is not to be used for the works; potable freshwater from a public utility undertaking will be brought to site for use in the works. No chemicals are to be added to the water supply used in the hosing works. The use of hot water is prohibited.

Due consideration must be given to run-off and the risk of contaminates removed from the surface entering water courses or affecting the surrounding flora and fauna. The Contractor shall ensure any waste materials from the works are collected and disposed of correctly. In Natura 2000 sites or sites with freshwater pearl mussels are present, only soft washing (<500psi) of metal parapets is allowed. If the bridge drainage at these sites leads directly into the watercourse, the outfall of all gullies on the bridge must be blocked during works and the gullies must be sucked out following the power hosing to ensure the water and waste material does not reach the watercourse.

Assessment of In-combination effects

Following the application of the mitigation measures described above, there will be no residual impacts arising from the proposed works. Considering this, the small scale and temporary nature of the proposed works, there is no potential for in-combination effects with the other work elements or with other pans and projects, as outlined in Section 5.7.

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on the Lough Carra/Mask Complex SAC and Lough Carra SPA or any other European site.

6. Conclusions

This NIS provides the competent authority with supporting information to undertake Appropriate Assessment in relation to the proposed works at 28 bridges in the North West Region under the Term Maintenance Contract No 3.

This NIS has examined the potential impacts of the proposed works on the integrity of Natura 2000 sites within the zone of influence of the 28 bridges, alone and in combination with other plans and projects, taking into account a sites' structure, function and conservation objectives. Where potential significant impacts were identified, mitigation measures have been recommended to preclude these impacts.

Thus the potential direct, indirect and cumulative impacts on the qualifying interests and conservation objectives for SACs and SPAs within the zone of influence of the proposed project, and the implementation of the proposed mitigation measures, it has been concluded by the authors of this report that the proposed project, i.e. maintenance works at 28 bridges, will not have an adverse effect on the integrity of those SACs and SPAs.

References

CIEEM (2016). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

Cooper, L. M. (2004). Guidelines for Cumulative Effects Assessment in SEA of Plans, EPMG Occasional Paper 04/LMC/CEA, Imperial College London.

DoEHLG (2009). 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.

EPA (2009). Code of Practice; Wastewater Treatment Systems and Disposal Systems serving Single Houses (p.e. ≤10). Environmental Protection Agency, Co. Wexford, Ireland.

EPA (2018). Code of Practice, Domestic Waste Water Treatment Systems (Population Equivalent ≤10) Draft 26 November 2018. Environmental Protection Agency, Ireland.

European Commission (2001). Assessment of Plans and Projects significantly affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.

European Commission (2017). Managing Natura 2000 Sites: The Provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

European Union Habitats Directive, (1992). Council Directives 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

Inland Fisheries Ireland, (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Water. Available at: https://www.fisheriesireland.ie/documents/624-guidelines-on-protection-of-fisheries-during-construction-works-in-and-adjacent-to-waters/file.html

NS2 (2009) Monitoring Methods Report Freshwater Pearl Mussel Sub-basin Plans. North South 2 Project. Available at: http://www.wfdireland.ie/docs/5_FreshwaterPearlMusselPlans/Monitoring%20Manual/NS2%20FPM%20Monitoring%20Methods%20Report%20160609.pdf. Accessed on 20/06/2019.

Scott Wilson and Levett-Therivel, (2006). Appropriate Assessment of Plans. Scott Wilson, Levett-Therivel Sustainability Consultants, Treweek Environmental Consultants and Land Use Consultants.

Appendices

Appendix A. Qualifying Interests of Natura 2000 sites

Special Conservation Interests (SCIs) of Natura 2000 sites

Special Areas of Conservation (SAC)

Ballyness Bay SAC (001090)			
Structure ID	**Within SAC**	**Watercourse (Source: EPA)**	**WFD Sub-Catchment**
DL-N56-046.00	Within	Glenna	Tullaghobegly_SC_010
SCI Description			
1013 Geyer's whorl snail *(Vertigo geyeri)* 1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide 2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with Ammophila arenaria (white dunes) 2130 * Fixed coastal dunes with herbaceous vegetation (grey dunes) 2190 Humid dune slacks * indicates a priority habitat under the Habitats Directive			

Bellacorick Bog Complex SAC (001922)			
Structure ID	**Within SAC**	**Watercourse (Source: EPA)**	**WFD Sub-Catchment**
MO-N59-008.00	Within	Deel[Crossmolina]_SC_010	Bellacorick Bog Complex SAC (001922)
SCI Description			
1013 Geyer's whorl snail *(Vertigo geyeri)* 1528 March saxifrage (*Saxifraga hirculus)* 3160 Natural dystrophic lakes and ponds 4010 Northern Atlantic wet heaths with Erica tetralix 7130 Blanket bogs (* if active bog) 7150 Depressions on peat substrates of the Rhynchosporion 7230 Alkaline fens * indicates a priority habitat under the Habitats Directive			

Ben Bulben, Gleniff And Glenade Complex SAC (000623)			
Structure ID	**Within SAC**	**Watercourse (Source: EPA)**	**WFD Sub-Catchment**
LM-N16-018.00	Within	Undefined	Drumcliff_SC_010
SCI Description			
1013 Geyer's whorl snail *(Vertigo geyeri)* 1355 Otter *(Lutra lutra)* 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation 4010 Northern Atlantic wet heaths with *Erica tetralix* 4030 European dry heaths 4060 Alpine and Boreal heaths 5130 *Juniperus communis* formations on heaths or calcareous grasslands 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates *(Festuco-Brometalia)* (* important orchid sites) 6230 * Species-rich Nardus grasslands, on *silicious* substrates in mountain areas (and submountain areas in Continental Europe) 6430 *Hydrophilous* tall herb fringe communities of plains and of the montane to alpine levels 7140 Transition mires and quaking bogs 7220 * Petrifying springs with tufa formation (*Cratoneurion*) 7230 Alkaline fens 8110 Siliceous scree of the montane to snow levels (*Androsacetalia alpinae and Galeopsietalia ladani)* 8120 Calcareous and calcshist screes of the montane to alpine levels *(Thlaspietea rotundifolii)* 8210 Calcareous rocky slopes with chasmophytic vegetation * indicates a priority habitat under the Habitats Directive			

Bunduff Lough And Machair/Trawalua/Mullaghmore SAC (000625)

Structure ID	Within SAC	Watercourse (Source: EPA)	WFD Sub-Catchment
LM-N15-002.00	Within 50m	Duff	Duff_SC_010

SCI Description

1065 Marsh Fritillary *(Euphydryas aurinia)*
1395 Petalwort *(Petalophyllum ralfsii)*
1140 Mudflats and sandflats not covered by seawater at low tide
1160 Large shallow inlets and bays
1170 Reefs
2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)
2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)
2190 Humid dune slacks
5130 *Juniperus communis* formations on heaths or calcareous grasslands
6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates *(Festuco-Brometalia)* (* important orchid sites)
7230 Alkaline fens
21A0 Machairs (* in Ireland)

* indicates a priority habitat under the Habitats Directive

Clew Bay Complex SAC (001150)

Structure ID	Within SAC	Watercourse (Source: EPA)	WFD Sub-Catchment
MO-N59-042.00	Witin	Undefined	Srahmore_SC_010

SCI Description

1013 Geyer's whorl snail *(Vertigo geyeri)*
1355 Otter *(Lutra lutra)*
1365 Common seal *(Phoca vitulina)*
1140 Mudflats and sandflats not covered by seawater at low tide
1150 * Coastal lagoons
1160 Large shallow inlets and bays
1210 Annual vegetation of drift lines
1220 Perennial vegetation of stony banks
1330 Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)*
2110 Embryonic shifting dunes
2120 "Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)
21A0 Machairs (* in Ireland)
91A0 Old sessile oak woods with Ilex and *Blechnum* in the British Isles

* indicates a priority habitat under the Habitats Directive

Connemara Bog Complex SAC (002034)

Structure ID	Within SAC	Watercourse (Source: EPA)	WFD Sub-Catchment
GC-N59-038.00	Within	Undefined	Ballycuirke Lough Stream_SC_010

SCI Description

1065 Marsh Fritillary *(Euphydryas aurinia)*
1106 Atlantic salmon *(Salmo salar)*
1355 Otter *(Lutra lutra)*
1833 Slender Naiad *(Najas flexilis)*
1150 * Coastal lagoons
1170 Reefs
3110 Oligotrophic waters containing very few minerals of sandy plains *(Littorelletalia uniflorae)*
3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea*
3160 Natural dystrophic lakes and ponds
3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation
4010 Northern Atlantic wet heaths with Erica tetralix
4030 European dry heaths
6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
7130 Blanket bogs (* if active bog)
7140 Transition mires and quaking bogs
7150 Depressions on peat substrates of the Rhynchosporion
7230 Alkaline fens
91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles

* indicates a priority habitat under the Habitats Directive

Donegal Bay (Murvagh) SAC (000133)

Structure ID	Within SAC	Watercourse (Source: EPA)	WFD Sub-Catchment
DL-N56-006.00	Within	Donegal Bay	Donegal Bay North_37

SCI Description

1365 Harbour seal (Phoca vitulina)
1140 Mudflats and sandflats not covered by seawater at low tide
2130 *Fixed coastal dunes with herbaceous vegetation (grey dunes)
2170 Dunes with Salix repens ssp. argentea (Salicion arenariae)
2190 Humid dune slacks

* indicates a priority habitat under the Habitats Directive

Leannan River SAC (002176)

Structure ID	Within SAC	Watercourse (Source: EPA)	WFD Sub-Catchment
DL-N56-060.00	Within	Leannan	Leannan_SC_020

SCI Description

1029 Freshwater pearl mussel *(Margaritifera margaritifera)*
1106 Atlantic salmon *(Salmo salar)*
1355 Otter *(Lutra lutra)*
1833 Slender Naiad *(Najas flexilis)*
3110 Oligotrophic waters containing very few minerals of sandy plains *Littorelletalia uniflorae*
3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea*

* indicates a priority habitat under the Habitats Directive

Lough Carra/Mask Complex SAC (001774)

Structure ID	Within SAC	Watercourse (Source: EPA)	WFD Sub-Catchment
MO-N84-005.0	Within	Aghinish 30	Aghinish_SC_010

SCI Description

1303 Lesser horseshoe bat (Rhinolophus hipposideros)
1355 Otter (Lutra lutra)
1393 Slender Green Feather-moss *(Drepanocladus vernicosus)*
91E0 * Alluvial forests with *Alnus glutinosa* and Fraxinus excelsior *(Alno-Padion, Alnion incanae, Salicion albae)*
3110 Oligotrophic waters containing very few minerals of sandy plains *(Littorelletalia uniflorae)*
3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea*
3140 Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.
4030 European dry heaths
6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates *(Festuco-Brometalia)* (* important orchid sites)
7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae**
7230 Alkaline fens
8240 Limestone pavements*

* indicates a priority habitat under the Habitats Directive

Lough Eske And Ardnamona Wood SAC (000163)

Structure ID	Within SAC	Watercourse (Source: EPA)	WFD Sub-Catchment
DL-N15-014.00	Within	Drumenny	Eske_SC_010
DL-N56-001.00	Within	Eske 37	Eske_SC_010
SCI	**Description**		

1029 Freshwater pearl mussel *(Margaritifera margaritifera)*
1106 Atlantic salmon *(Salmo salar)*
1421 Killarney fern *(Trichomanes speciosum)*
3110 Oligotrophic waters containing very few minerals of sandy plains *(Littorelletalia uniflorae)*
7220 Petrifying springs with tufa formation *(Cratoneurion)**
91A0 Old sessile oak woods with Ilex and *Blechnum* in the British Isles

* indicates a priority habitat under the Habitats Directive

Lough Gill SAC (001976)

Structure ID	Within SAC	Watercourse (Source: EPA)	WFD Sub-Catchment
LM-N16-012.00	Within	Pollboy Bridge West	Shanvaus 35
SCI	**Description**		

1092 White-clayed crayfish *(Austropotamobius pallipes)*
1095 Sea lamprey *(Petromyzon marinus)*
1096 Brook lamprey *(Lampetra planeri)*
1099 River lamprey *(Lampetra fluviatilis)*
1106 Atlantic salmon *(Salmo salar)*
1355 Otter *(Lutra lutra)*
91E0 Alluvial forests with *Alnus glutinosa* and Fraxinus excelsior *(Alno-Padion, Alnion incanae, Salicion albae)**
3150 Natural eutrophic lakes with *Magnopotamion or Hydrocharition* - type vegetation
6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia)* (* important orchid sites)

* indicates a priority habitat under the Habitats Directive

Mweelrea/Sheeffry/Erriff Complex SAC (001932)

Structure ID	Within SAC	Watercourse (Source: EPA)	WFD Sub-Catchment
MO-N59-063.00	Within 50m	Undefined	Erriff_SC_010
MO-N59-066.00	Within	32G04	Erriff_SC_010
SCI Description			

1013 Geyer's whorl snail *(Vertigo geyeri)*
1014 Narrow-mouthed whorl snail *(Vertigo angustior)*
1029 Freshwater peal mussel *(Margaritifera margaritifera)*
1106 Atlantic salmon *(Salmo salar)*
1355 Otter *(Lutra lutra)*
1395 Petalwort *(Petalophyllum ralfsii)*
1833 Slender Naiad *(Najas flexilis)*
1150 Coastal lagoons*
1210 Annual vegetation of drift lines
1330 Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)*
1410 Mediterranean salt meadows *(Juncetalia maritimi)*
2110 Embryonic shifting dunes
2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)
2150 Atlantic decalcified fixed dunes *(Calluno-Ulicetea)*
2170 Dunes with Salix *repens ssp. argentea (Salicion arenariae)*
3110 Oligotrophic waters containing very few minerals of sandy plains *(Littorelletalia uniflorae)*
3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea*
3160 Natural dystrophic lakes and ponds
3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
4010 Northern Atlantic wet heaths with *Erica tetralix*
4030 European dry heaths
4060 Alpine and Boreal heaths
5130 *Juniperus communis* formations on heaths or calcareous grasslands
6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
7130 Blanket bogs (* if active bog)
7140 Transition mires and quaking bogs
7150 Depressions on peat substrates of the *Rhynchosporion*
7220 Petrifying springs with tufa formation *(Cratoneurion)**
7230 Alkaline fens
8110 Siliceous scree of the montane to snow levels (*Androsacetalia alpinae and Galeopsietalia ladani*)
8210 Calcareous rocky slopes with *chasmophytic* vegetation
8220 Siliceous rocky slopes with *chasmophytic* vegetation
21A0 Machairs (* in Ireland)

* indicates a priority habitat under the Habitats Directive

Owenduff/Nephin Complex SAC (000534)

Structure ID	Within SAC	Watercourse (Source: EPA)	WFD Sub-Catchment
MO-N59-024.00	Within	MUINGNAHALLOONA	Owenmore[Mayo]_SC_030

SCI Description

1106 Atlantic salmon *(Salmo salar)*
1355 Otter *(Lutra lutra)*
1528 March *(Saxifraga hirculus)*
1393 Slender Green Feather-moss *(Hamatocaulis vernicosus)*
3110 Oligotrophic waters containing very few minerals of sandy plains *(Littorelletalia uniflorae)*
3160 Natural dystrophic lakes and ponds
3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
4010 Northern Atlantic wet heaths with *Erica tetralix*
4060 Alpine and Boreal heaths
5130 *Juniperus communis* formations on heaths or calcareous grasslands
7130 Blanket bogs (* if active bog)
7140 Transition mires and quaking bogs

* indicates a priority habitat under the Habitats Directive

River Moy SAC (002298)

Structure ID	Within SAC	Watercourse (Source: EPA)	WFD Sub-Catchment
MO-N59-003.00	Within	Deel [Crossmolina]	Deel[Crossmolina]_SC_020
MO-N60-002.00	Within	Manulla 34	Castlebar_SC_020

SCI Description

1092 White-clayed crayfish *(Austropotamobius pallipes)*
1095 Sea lamprey *(Petromyzon marinus)*
1096 Brook lamprey *(Lampetra planeri)*
1106 Atlantic salmon *(Salmo salar)*
1355 Otter *(Lutra lutra)*
91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)
7110 Active raised bogs
7120 Degraded raised bogs still capable of natural regeneration
7150 Depressions on peat substrates of the *Rhynchosporion*
7230 Alkaline fens
91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

* indicates a priority habitat under the Habitats Directive

West of Ardara/Maas Road SAC (000197)

Structure ID	Within SAC	Watercourse (Source: EPA)	WFD Sub-Catchment
DL-N56-033.00	Within	Gweebarra Estuary	Gweebarra_SC_010

SCI Description

1013 Geyer's Whorl Snail *(Vertigo geyeri)*
1029 Freshwater pearl mussel *(Margaritifera margaritifera)*
1065 Marsh Fritillary *(Euphydryas aurinia)*
1106 Atlantic salmon *(Salmo salar)*
1355 Otter *(Lutra lutra)*
1365 Harbour seal *(Phoca vitulina)*
1395 Petalwort *(Petalophyllum ralfsii)*
1833 Sleneder naiad *(Najas flexilis)*
1130 Estuaries
1140 Mudflats and sandflats not covered by seawater at low tide
1160 Large shallow inlets and bays
1210 Annual vegetation of drift lines
1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae)*
1410 Mediterranean salt meadows *(Juncetalia maritimi)*
2110 Embryonic shifting dunes
2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)
2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)
2140 Decalcified fixed dunes with *Empetrum nigrum*
2150 Atlantic decalcified fixed dunes *(Calluno-Ulicetea)*
2170 Dunes with *Salix repens* ssp. argentea *(Salicion arenariae)*
2190 Humid dune slacks
3110 Oligotrophic waters containing very few minerals of sandy plains *(Littorelletalia uniflorae)*
3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea*
4010 Northern Atlantic wet heaths with *Erica tetralix*
4030 European dry heaths
4060 Alpine and Boreal heaths
5130 *Juniperus communis* formations on heaths or calcareous grasslands
6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates *(Festuco-Brometalia)* (* important orchid sites)
6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils *(Molinion caeruleae)*
6510 Lowland hay meadows *(Alopecurus pratensis, Sanguisorba officinalis)*
7130 Blanket bogs (* if active bog)
7150 Depressions on peat substrates of the *Rhynchosporion*
7230 Alkaline fens
21A0 Machairs (* in Ireland)

* indicates a priority habitat under the Habitats Directive

Lough Corrib SAC

Structure ID	Within SAC	Watercourse (Source: EPA)	WFD Sub-Catchment
GB-N06-006.00	ca. 1.2km d/s of bridge	Terryland	Corrib_SC_010

SCI Description

1029 Freshwater pearl museel *(Margaritifera margaritifera)*
1092 White-clayed crayfish *(Austropotamobius pallipes)*
1095 Sea lamprey *(Petromyzon marinus)*
1096 Brook lamprey *(Lampetra planeri)*
1106 Atlantic salmon *(Salmo salar)*
1303 Lesser horseshoe bat *(Rhinolophus hipposideros)*
1355 Otter *(Lutra lutra)*
1833 Slender naiad *(Najas flexilis)*
6216 Slender Green Feather-moss *(Hamatocaulis vernicosus)*
3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)
3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea*
3140 Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.
3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates *(Festuco-Brometalia)* (* important orchid sites)
6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils *(Molinion caeruleae)*
7110 Active raised bogs*
7120 Degraded raised bogs still capable of natural regeneration
7150 Depressions on peat substrates of the *Rhynchosporion*
7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae**
7220 Petrifying springs with tufa formation *(Cratoneurion)*
7230 Alkaline fens
8240 Limestone pavements*
91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
91D0 Bog woodland*

* indicates a priority habitat under the Habitats Directive

Special Protection Areas (SPAs)

Donegal Bay SPA (004151)			
Structure ID	**Within SPA/ distance to SPA downstream of bridge**	**Watercourse (Source: EPA)**	**WFD Sub-Catchment**
DL-N15-014.00	**ca. 3.2km d/s of bridge**	**Drumenny**	**Eske_SC_010**
DL-N56-006.00	**Within SPA**	**Donegal Bay**	
DL-N56-001.00	**ca. 1.7km d/s of bridge**	**Eske 37**	**Eske_SC_010**
SCI	**Description**		
A003 Great Northern Diver *(Gavia immer)* A046 Light-bellied Brent Goose *(Branta bernicla hrota)* A065 Common Scoter *(Melanitta nigra)* A144 Sanderling *(Calidris alba)* A999 Wetland and Waterbirds			

River Suck Callows SPA (004097)			
Structure ID	**Within SPA/ distance to SPA downstream of bridge**	**Watercourse (Source: EPA)**	**WFD Sub-Catchment**
GC-N63-019.00	**Within**	**Suck**	**Suck_SC_060**
GC-N63-015.00	**ca. 3.2km d/s of bridge**	**non-listed**	**Suck_SC_050**
SCI Description			
A038	Whooper Swan	Cygnus cygnus	
A395 Greenland White-fronted Goose *(Anser albifrons flavirostris)* A050 Wigeon *(Anas Penelope)* A140 Golden Plover *(Pluvialis apricaria)* A142 Lapwing *(Vanellus vanellus)* A999 Wetland and Waterbirds			

Owenduff/Nephin Complex SPA (004098)			
Structure ID	**Within SPA/ distance to SPA downstream of bridge**	**Watercourse (Source: EPA)**	**WFD Sub-Catchment**
MO-N59-024.00	**Within SPA**	**MUINGNAHALLOONA**	**Owenmore[Mayo]_SC_030**
MO-N59-026.00	**Within SPA**	**Undefined**	**Owenmore[Mayo]_SC_030**
SCI Description			
A098 Merlin *(Falco columbarius)* A140 Golden Plover *(Pluvialis apricaria)*			

Lough Carra SPA			
Structure ID	**Within SPA/ distance to SPA downstream of bridge**	**Watercourse (Source: EPA)**	**WFD Sub-Catchment**
MO-N84-005.00	**WithinSPA**	**Aghinish 30**	**Aghinish_SC_010**
SCI Description			
A182 Common Gull *(Larus canus)*			

Falcarragh to Meenlaragh SPA			
Structure ID	**Within SPA/ distance to SPA downstream of bridge**	**Watercourse (Source: EPA)**	**WFD Sub-Catchment**
DL-N56-046.00	**ca. 1.8km d/s of bridge**		
SCI Description			
A122 Corncrake *(Crex crex)*			

Inner Galway Bay SPA

Structure ID	Within SPA/ distance to SPA downstream of bridge	Watercourse (Source: EPA)	WFD Sub-Catchment
GB-N06-006.00	**ca 3.7km d/s of bridge**	**Terryland**	**Corrib_SC_010**

SCI Description

A003 Great Northern Diver *(Gavia immer)*
A017Cormorant (Phalacrocorax carbo)
A028 Grey Heron *(Ardea cinereal)*
A046 Light-bellied *Brent Goose (Branta bernicla hrota)*
A050 Wigeon *(Anas penelope)*
A052 Teal *(Anas crecca)*
A056 Shoveler (*Anas clypeata)*
A069 Red-breasted *(Merganser Mergus serrator)*
A137 Ringed Plover *(Charadrius hiaticula)*
A140 Golden Plover *(Pluvialis apricaria)*
A142 Lapwing *(Vanellus vanellus)*
A149 Dunlin *(Calidris alpine)*
A157 Bar-tailed Godwit *(Limosa lapponica)*

Drumcliff Bay SPA

Structure ID	Within SPA/ distance to SPA downstream of bridge	Watercourse (Source: EPA)	WFD Sub-Catchment
LM-N16-018.00	**ca. 9.5km d/s of bridge**	**Drumcliff_SC_010**	**No**
SCI	**Description**		

A144 Sanderling *(Calidris alba)*
A157 Bar-tailed Godwit *(Limosa lapponica)*
A999 Wetland and Waterbirds

Killala Bay/Moy Estuary SPA

Structure ID	Within SPA/ distance to SPA downstream of bridge	Watercourse (Source: EPA)	WFD Sub-Catchment
MO-N26-001.00	**ca. 4.5km d/s of bridge**	**Tullyegan 34**	**Moy_SC_100**
MO-N26-003.00	**ca. 13.6km d/s of bridge**	**Shanclough**	**Moy_SC_100**
SCI	**Description**		

A137 Ringed Plover *(Charadrius hiaticula)*
A140 Golden Plover *(Pluvialis apricaria)*
A141 Grey Plover *(Pluvialis squatarola)*
A144 Sanderling *(Calidris alba)*
A149 Dunlin *(Calidris alpine)*
A157 Bar-tailed Godwit *(Limosa lapponica)*
A160 Curlew *(Numenius arquata)*
A162 Redshank *(Tringa tetanus)*

WS Atkins International Limited
Unit 2B
2200 Cork Airport Business Park
Cork

[redacted]