

Bridge replacement Moy UB1 C1/46

Natura Impact Statement Draft

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Contract

This report describes work commissioned by the Office of Public Works. The Office of Public Works' representative for the contract was Tony Brew. Hannah Mulcahy, Steven Heathcote, Malin Lundberg and Colm O'Leary of JBA Consulting carried out this work.

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Purpose

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Executive summary

This report presents a Natura Impact Statement (NIS) for the replacement of a box culvert bridge UB1 on Channel C1/46, Chainage 200, near Coonainra, Co Mayo in the Moy Arterial Drainage Scheme. The scheme implements the legal duty on the OPW under the Arterial Drainage Acts of 1945 and 1995 to maintain structures that form part of the scheme and provide drainage and flood protection to the benefiting lands.

The project assessed is to demolish and remove an existing box culvert bridge structure and construction of new box culvert. This is beyond the scope of works considered in the existing NIS for the Moy Arterial Drainage Scheme (JBA Consulting, 2016; 2020) so is subject to a separate Appropriate Assessment.

A desk-based assessment was used to identify the baseline ecological conditions on and adjacent to the scheme channels.

The project zone of influence was determined using a modified version of the Ryan Hanley screening method (Ryan Hanley, 2014a). This screening method was prepared specifically for arterial drainage schemes based on experience of the impact of their implementation. The screening uses variable distances depending on pathways of impact. The screening process considered impact pathways via surface water, land and air, but not groundwater. Groundwater pathways were excluded given the proximity to surface water.

In carrying out a Stage 1 Appropriate Assessment Screening, a total of one European site was assessed as coming within the zone of influence of the project. As a result of the screening, this site, the River Moy Special Area of Conservation, is brought forward to Stage 2 Appropriate Assessment. Details of the site are presented including qualifying interest features, conservation objectives and threats and pressures.

A detailed assessment of potential adverse impacts was carried out following the Ryan Hanley Source-Receptor-Pathway approach developed for arterial drainage schemes but expanded to deal with the specific issues relating to culvert maintenance. The assessment identified a number of pathways to impact including increased suspended solids and release of nutrients/pollutants.

Avoidance and reduction measures are suggested for the works and these are sufficient to avoid and mitigate all effects of the project. The residual impact is considered in-combination with other plans or projects. No in-combination impacts were identified which would require further avoidance or mitigation.

The NIS has concluded that with the avoidance and mitigation measures proposed the project to replace the box culvert bridge would not have a significant adverse impact on the integrity of any European sites, in light of its conservation objectives and best scientific knowledge, either alone or in combination with other plans or projects.

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Abbreviations

AA	Appropriate Assessment
CIEEM	Chartered Institute of Ecology and Environmental Management
CO	Conservation Objectives
DoEHLG	Department of the Environment, Heritage and Local Government
EC	European Community
EIA	Environmental Impact Assessment
EP	Environmental Procedures
EPA	Environmental Protection Agency
IFI	Inland Fisheries Ireland
IROPI	Imperative Reasons of Overriding Public Interest
IUCN	International Union for Conservation of Nature
I-WeBS	Irish Wetland Bird Survey
LSE	Likely Significant Effect
NIS	Natura Impact Statement
NBDC	National Biodiversity Data Centre
NNIS	Non-Native Invasive Species
NPWS	National Parks and Wildlife Services
OPW	Office of Public Works
RBMP	River Basin Management Plan
SAC	Special Area of Conservation
SPA	Special Protection Area
SWD	Surface Water Dependant
QI	Qualifying Interests
WFD	Water Framework Directive
ZOI	Zone of Influence

1 Introduction

1.1 Background

JBA Consulting has been appointed by the Office of Public Works (OPW) to undertake an Appropriate Assessment of the effects of a project to demolish and remove an existing box culvert bridge structure and construct a new box culvert bridge at a box culvert bridge UB1 on Channel C1/46, Chainage 200, near Coonainra, Co Mayo.

This Natura Impact Statement (NIS) documents the Appropriate Assessment process and results to enable the competent authority to undertake an appropriate assessment in accordance with Article 6(3) of the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora) and Regulation 42 of the Birds and Natural Habitats Regulations 2011 (as amended).

The proposed project is part of the maintenance of the Moy Arterial Drainage Scheme, required as part of maintenance activities under the Arterial Drainage Acts of 1945 and 1995. However, the proposed activities go beyond the scope of standard activities considered in the Moy Arterial Drainage Scheme NIS (JBA Consulting, 2016), an updated NIS for the coming 5 years is currently going through approval (JBA Consulting, 2021). Therefore, the proposed activities require separate assessment.

1.2 Legislative Context

The Habitats Directive (Directive 92/43/EEC) aims to maintain or restore the favourable conservation status of habitats and species of community interest across Europe. The requirements of Articles 6(3) and 6(4) of the Habitats Directive have been transposed into Irish legislation by means *inter alia* the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011).

Under the Directive a network of sites of nature conservation importance have been identified by each Member State as containing specified habitats or species requiring to be maintained or returned to favourable conservation status. In Ireland the network consists of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), and also candidate sites, which together form the Natura 2000 network.

Article 6(3) of the Habitats Directive requires that, in relation to European designated sites (i.e. SACs and SPAs that form the *Natura 2000* network), "*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*".

A competent authority (e.g. Local Authority) can only grant consent for a plan or project after having determined that it will not adversely affect the integrity of any European site, in light of its conservation objectives and best scientific evidence, either alone or in combination with other plans or projects.

1.3 Appropriate Assessment Process

Guidance on the Appropriate Assessment (AA) process was produced by the European Commission in 2002, which was subsequently developed into guidance specifically for Ireland by the Department of Environment, Heritage and Local Government (DoEHLG) (2009 rev 2010). These guidance documents identify a staged approach to conducting an AA, as shown in Figure 1-1. Stages 3 and 4 are necessary if a project is likely to have adverse impacts on European sites and are not discussed further here.



Figure 1-1: The Appropriate Assessment Process

1.3.1 Stage 1 - Screening for AA

The initial, screening stage of the Appropriate Assessment is to determine:

- a) whether the proposed plan or project is directly connected with, or necessary for, the management of the European designated site for nature conservation
- b) if it is likely to have a significant adverse effect on the European designated site, either individually or in combination with other plans or projects

For those sites where potential adverse impacts are identified, either alone or in combination with other plans or projects, further assessment is necessary to determine if the proposals will have an adverse impact on the integrity of a European designated site, taking into account the sites conservation objectives (i.e. the process proceeds to Stage 2).

1.3.2 Stage 2 - AA

This stage requires a more in-depth evaluation of the plan or project, and the potential direct and indirect adverse impacts arising from it on the integrity and the interest features of the European designated site(s), alone and in-combination with other plans and projects, taking into account the site's structure, function and conservation objectives and best scientific knowledge in the field. Where required, mitigation or avoidance measures will be added to the project.

The competent authority can only grant consent for the plan or project after having ascertained that it will not adversely affect the integrity of any European site, in light of its conservation objectives and best scientific evidence, either alone or in combination with other plans or projects after avoidance and mitigation measures have been applied (if necessary) and the measures are capable of being, and certain to be, successfully implemented. If this cannot be determined then alternative solutions will need to be considered (i.e. the process proceeds to Stage 3).

1.3.3 Recent judgements of the Court of Justice of the European Union (CJEU) and how they are used in this assessment

The CJEU issued a ruling on the consideration of avoidance and reduction measures as a result of the case known as People over Wind, Peter Sweetman v Coillte Teoranta (Case C-323/17). This judgement stated that measures intended to reduce or avoid effects on a European site should only be considered within the framework of an Appropriate Assessment, and it is not permissible to take into account such measures at the screening stage. In practice, this means that any activities that are not integral to the project (i.e. the project could conceivably take place without them) and have the effect of avoiding or reducing an impact on a European site, cannot be considered at the screening stage.

The CJEU ruling in the case of Grace & Sweetman [2018] (C-164/17) clarified the difference between avoidance and reduction (mitigation) measures and compensation. Measures intended to compensate for the negative effects of a project cannot be taken into account in the assessment of the implications of a project, and instead are considered under Article 6(4). This means that any project where an effect on the integrity of a European site remains and can only be offset by compensation, would

need to proceed under Article 6(4), demonstrating “imperative reasons of overriding public interest”.

The judgements referred to as the Dutch Nitrogen cases [2018] (C-293/17 and C-294/17) have important implications for projects that could potentially impact on sites that are exceeding critical thresholds for input of damaging ammonia (but could also reasonably apply where other nutrients are impacting European sites). The judgements state that the use of thresholds to exclude project impacts is acceptable in principle, and that strategic plans can be used as mitigation but only with consideration of the certainty (or otherwise) of the outcomes of those strategic plans. It clarifies that where the status of a habitat type is already unfavourable the possibility of authorising activities which increase the problem is necessarily limited.

The CJEU ruling in the case of *Holohan v An Bord Pleanala* (C-462/17) also clarified the importance in Appropriate Assessment of taking into account habitat types and species outside the boundary of the European site where implications of the impacts on those habitat and species may impact the conservation objectives of the European site. In this assessment functionally linked and supporting habitat for species outside of European sites are assessed where they could potentially impact the conservation objectives of any screened in European sites.

1.4 Structure of this report

In order to provide the competent authority with the relevant information to determine with confidence their conclusions on the overall impacts of the project to the integrity of the European sites concerned, this NIS presents the following:

- Section 2: Details of the methods used in this assessment.
- Section 3: A detailed description of the proposed project and its Zone of Influence.
- Section 4: A detailed description of the baseline conditions within the area of works.
- Section 5: A screening of European sites based on those that are located within the Zone of Influence (ZOI) of the proposed works.
- Section 6: A description of those European sites that are screened in for being at risk for potential adverse impacts from the proposed works.
- Section 7: Identification of potential sources of impact to the screened in European sites and assessment of the impacts for significance. Where effects are present specific mitigation is proposed.
- Section 8: Assessment of cumulative and/or in-combination impacts where non-significant effects are present.
- Section 9: Summary of the impacts and mitigation with overall assessment on the coherence of the European network.

2 Methodology

This NIS has been prepared having regard to the Birds and Habitats Directives, the European Communities (Birds and Natural Habitats) Regulations 2011-15 as amended and relevant jurisprudence of the EU and Irish courts. The following documents have also been used to provide guidance during the assessment:

- DoEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government. Revised 2010.
- European Commission (EC) (2019) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission.
- EC (2002) 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, Office for Official Publications of the European Communities, Luxembourg. European Commission.
- EC (2013) Interpretation Manual of European Union Habitats. Version EUR 28. European Commission.
- Fossitt (2000). A Guide to Habitats in Ireland. The Heritage Council, Kilkenny.
- Guidelines for Ecological Impact Assessment in the UK and Ireland - Terrestrial, Freshwater and Coastal, Second Ed. (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018)

2.1 Desktop Survey

A desktop survey was conducted of available published and unpublished information, along with a review of data available on the National Parks and Wildlife Service (NPWS) and National Biodiversity Data Centre (NBDC) web-based databases, in order to identify key habitats and species (including legally protected and species of conservation concern) that may be present within ecologically relevant distances from the scheme as explained below. The data sources below were consulted for the desktop study:

- NBDC species data within 2km of the scheme channels, within the past 10 years.
- NPWS website (www.npws.ie), (<https://www.npws.ie/>), where site synopses, Natura 2000 data forms and conservation objectives were obtained along with Annex I habitat distribution data and status reports.
- NBDC Maps (<http://maps.biodiversityireland.ie/#/Map>)
- (NPWS 2019a). The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview. Unpublished NPWS report.
- NPWS (2019b). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report.
- NPWS (2019c). The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments. Unpublished NPWS report.
- Environmental Protection Agency (EPA) maps website (<https://gis.epa.ie/EPAMaps/>)
- BirdWatch Ireland (www.birdwatchireland.ie)
- Bird survey data from the waterbird survey programme and the Irish Wetland Bird Survey (I-WeBS)
- 5-year NIS for Moy Arterial Drainage Maintenance Scheme (JBA Consulting 2016; 2021)

2.2 Screening Method

The screening method follows closely the method developed to screen impacts of Arterial Drainage Schemes by (Ryan Hanley, 2014a). The method sets out a series to 10 steps for identifying possible adverse impacts via surface water, land and air, and groundwater pathways. The steps identify the widest possible zone of influence then gradually screen out sites on the basis of distance, susceptibility of QI to each pathway and particular conditions that would allow adverse impacts to be conveyed between the project and the European site. However, the Ryan Hanley method is designed for the large-scale maintenance activities, rather than discrete projects located in a small area and with a limited footprint. Some of the steps in the Ryan Hanley method were therefore simplified or removed to account for this difference.. Groundwater effects were considered only where the project requires excavation below existing bed levels or where piling or other operations likely to impact bedrock are included. The screening method has been updated to take into account environmental procedures (EP) which are considered part of the project description, that is they will be implemented regardless of setting and there is high confidence in their effectiveness. Some EPs are implemented only in specific locations, so these are not considered part of the project description. In particular the impacts of the implementation EP7 and EP10, which are always completed, prevent impacts related to poor-practice for vegetation and silt management respectively. The OPW implements a programme of training and audit which ensures these EPs are implemented with a high degree of confidence allowing them to be included with certainty as part of the project description.

2.3 Impact Assessment Method

The assessment used the source-pathway-receptor model which is a conventional model used for determining the risk of impact to a site or qualifying interest (CIEEM, 2018). For Arterial Drainage Schemes this is implemented using the guidance provided by (Ryan Hanley, 2014b) which is developed to examine the specific impacts related to the Arterial Drainage Schemes.

Risk is the likelihood or expected frequency of a specified adverse consequence or impact. Applied to the Habitats Directive and the Arterial Drainage Maintenance programme, it expresses the likelihood of an adverse impact arising as a result of the proposed works and associated activities. The proposed works or activities that may occur as a result of the Arterial Drainage Maintenance programme can be considered a potential hazard. A hazard presents a risk when it is likely to affect something of value (i.e. the European sites and their Qualifying Interests (QIs)). It is the combination of the probability of the hazard of occurring and its consequences that is the basis of a risk assessment which an NIS essentially is:

$$\text{Risk} = \text{probability of an event} \times \text{consequential damage}$$

The source-pathway-receptor model is a useful tool for determine if a risk is present. In order for a risk to be present, all three elements must be present.

Source: The source considered in this report, is the proposed works or activity that will occur as a result of the Arterial Drainage Maintenance programme. Key considerations in assessing the source are the nature and scale of the potential impacts that may arise such as the type of contaminants that may arise, the contaminant loading and other physical attributes. The point of occurrence is a critical reference point for assessing the attributes of the Source of any potential adverse impacts.

Pathway: Pathways are established by surface water, groundwater and land and air connections. The pathway includes everything between the source and the receptor; from point of release of potential adverse impacts, such as contaminants, to the receptor. The location, nature, connectivity and extent of wells, groundwater dependent ecosystems, aquifers and faults can all influence the nature of a pathway. Rivers, streams and drainage ditches could all act as potential pathways for potential waterborne impacts. Land and air pathways to be considered include those that may

transfer direct physical impacts, noise and visual disturbance (vibrations) and dust or other airborne particles.

Receptor: The receptor is the qualifying interests of the relevant European sites, their Conservation Objectives (COs) and the overall integrity of the European sites. While the competent authority should only agree to the plan or project after having ascertained that it will not adversely affect the integrity of the site concerned. In order to determine the significance of any potential adverse impacts that may occur that may adversely affect the integrity of the European site, the COs of each site are assessed relative to the potential impacts that may occur as a result of the proposed works. Each European site will either have specific or generic conservation objectives. Detailed site-specific COs have been provided for some of SACs and SPAs, which can be found within the CO document for each site on the NPWS website and Appendix A. Generic conservation objectives have been compiled for the remaining SACs and SPA based on COs for the same species or habitats in SACs and SPAs with similar characteristics.

The overall aim of COs is to maintain or restore the favourable conservation conditions of the Annex I habitats and/or the Annex II species for which a SAC or SPA has been selected, under which the site-specific objectives contain more detailed attributes, measures and targets. There are a set of generic COs for species and habitats. For some sites these have been developed into site-specific objectives.

2.4 In-combination Assessment

The in-combination assessment is based on the process developed by DTA Ecology (Tyldesley and Chapman, 2013). If a project has no impacts alone, there is no feasible pathway for in-combination impacts. However, if there are residual impacts, even ones that would not cause likely significant effects then an in-combination assessment will be completed. The assessment method was based on searching for plans and projects, including the ongoing OPW Arterial Drainage Scheme works, where the bridge works could have residual impacts that may be increased in-combination with other projects. Where these impacts were identified, the relevant screening distance for the impact pathway from Ryan Hanley (2014a) was applied to European site. Within this screening distance any plans and projects were searched for. If the plan or project had a published Appropriate Assessment which was not subject to a further information request, this was reviewed for possible in-combination impacts. If this NIS concluded no impacts (including no non-significant residual impacts) alone, the plan or project was ruled out of the in-combination assessment, and this is noted in the text. If the AA included potential residual impacts, or if it was subject to a further information request, then it was taken forward for impact assessment in-combination with the arterial drainage scheme.

2.5 Consultation

No formal consultations have been taken on the proposed works. The draft of this NIS should be subject to consultation with NPWS as the Statutory Nature Conservation Body for Ireland.

2.6 Competent Persons

The assessment has been carried out by JBA ecologists Malin Lundberg (BSc, MSc) and Hannah Mulcahy (BSc (Hons), MSc). They have both undertaken Appropriate Assessment reports and NIS assessments for a variety of schemes in Ireland as well as assessment of projects under Article 6 of the Habitats Directive in a range of European countries. The assessment has been reviewed by Dr Steven Heathcote BA(Hons) DPhil MCIEEM, a Senior Ecologist with over 10 years' consultancy experience in undertaking assessments under the Habitats Directive.

2.7 Limitations and Constraints

The conclusion of this report necessarily relies on some assumptions and it is inevitably subject to some limitations. Most of the assumptions and limitations would not affect the conclusion but the following points are recorded to ensure the basis of the assessment is clear:

- The assessment did not involve any field surveys by an ecologist and is based on existing data and information provided by site operatives. Information obtained from the desk sources including aerial images and site photographs is typically sufficient to inform the screening but where necessary the precautionary principle has been applied in assessing habitat condition and potential presence of mobile species.

3 Project Description

3.1 The 'Project'

The proposed demolition and removal of an existing box culvert bridge structure and construction of new box culvert bridge meets the criteria of a 'Project' as defined in the European Communities (Birds and Natural Habitats) Regulations 2011, as amended and is not directly connected with or necessary to the management of any European site. Therefore it is subject to the requirements of the Appropriate Assessment process.

The OPW is statutorily obligated to maintain arterial drainage channels under the 1945 and 1995 Arterial Drainage Acts, and since their completion, maintenance of these Arterial Drainage Schemes has been ongoing. Significant works not included in the standard maintenance are subject to separate assessment, as is the case with these proposed bridge replacements.

3.2 Project Location

The proposed works will include the demolition and removal of an existing box culvert bridge structure and construction of new box culvert bridge UB1 on C1/46, Chainage 200, near Coonainra, Co Mayo (GPS coordinates 53.994, -8.896). The channel will be dammed so that works can be carried out in the dry, and the water will either be diverted through a channel, or over-pumped.

Channel C1/46 is an unnamed minor stream which enters the River Moy 190m downstream from the bridge .

The site compound will be located in an agricultural field just off an unnamed minor public road (Figure 3-1).

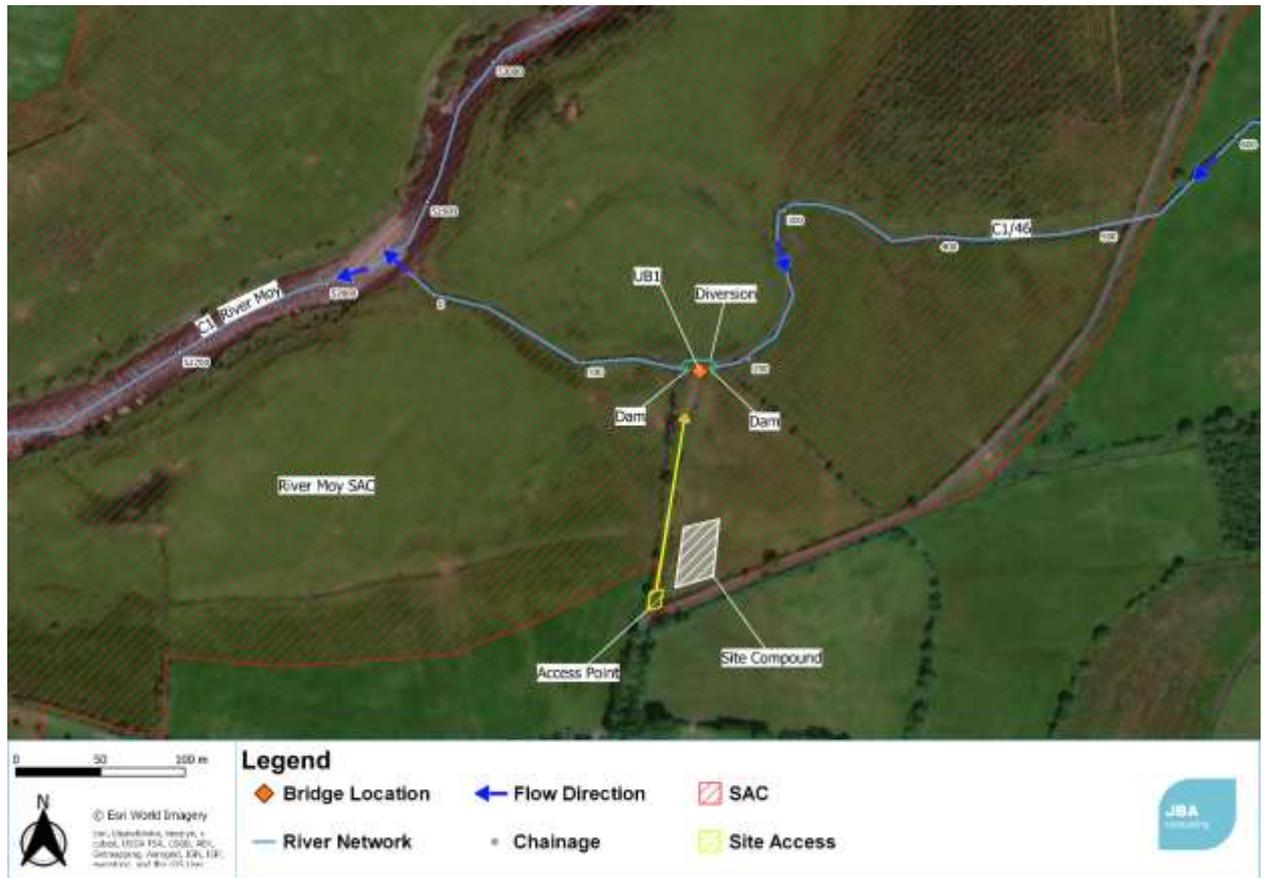


Figure 3-1 Location of bridge UB1 in Moy Catchment

3.3 Description of Project Activities

The method statement, compiled by OPW, for the demolition and removal of an existing box culvert bridge structure and construction of new box culvert bridge is included in Appendix A. The potential sources of impact from the method statement are summarised in Table 3-1.

Table 3-1. Summary of project impacts

Project Elements	Comment
Size and scale	<p>The works include demolition and removal of an existing box culvert bridge structure and construction of new box culvert bridge, designed in accordance with the OPW Standard Design. The works area will be de-watered by using one of two options. One option is to dam and create a diversion channel, which would be excavated from a point upstream of the existing bridge and tie back into the channel at a point downstream. The other option is to dam and pump water onto grassland for natural filtration. Which method will be used will be based on ground conditions and flow rates.</p> <p>This operation is a relatively small-scale and localised operation compared to standard OPW works.</p>
Land-take	<p>There would be no permanent land take, with all operations being temporary. The temporary land-take would be a small area of compound and material storage for the demolition and replacement of the existing bridge.</p> <p>Surrounding area will be reinstated following completion of works.</p>
Distance from European site or key features of the site	<p>The bridge is located in the River Moy SAC (002298)</p>
Resource requirements (water abstraction etc.)	<p>The resources and materials used in the proposed works will be imported from off site.</p> <p>The channel will be de-watered in the works area but the water will not be permanently abstracted.</p>
Emissions (disposal to land, water or air)	<p>There will be a small quantity of airborne emissions from construction vehicles, but these will be negligible.</p> <p>No other emissions are anticipated.</p>
Excavation requirements	<p>Excavations may be made if diversion of the channel is required if damming and over pumping of the waterbody cannot be carried out. If a channel diversion is to take place this will be carried out on the left bank from a point upstream of the existing bridge and will tie back into the channel at a point downstream of the bridge. The bypass channel will be no deeper than the bed level of the existing river.</p> <p>The area around the existing bridge will be excavated to a suitable width and depth as per the requirements of the new bridge design.</p> <p>The surrounding area will be reinstated when the works are complete.</p>
Transportation requirements	<p>There will be a requirement to transport material and vehicles to the site along existing access routes.</p>
Duration of construction,	<p>The duration of works at this site are estimated to last for approximately 4 - 5 weeks (16 - 20 man weeks), to be</p>

operation, decommissioning etc.	undertaken during summer months. The existing bridge will be demolished and materials removed from site.
In-channel works	In order to demolish and replace the bridge, the channel will be de-watered. The method of de-watering the works area will be decided upon after mobilisation to site. Consideration will be given to ground conditions and flow rates. The options will be damming and diversion channel or damming and over-pumping.
Other	C1/46 is a Salmond Channel that outfalls into C1 River Moy 190m downstream

3.3.1 Works Access

The bridge is accessed via local unnamed public road and through agricultural land (see Figure 3-1).

3.3.2 Timing of Works

The duration of works at this site are estimated to last for approximately 4 - 5 weeks (16 – 20 man weeks). It is intended to carry out the works in summer months at times of low flow and when the land surrounding the bridge is at its most dry.

3.3.3 Guidance for Drainage Maintenance Activities

The OPW Environmental Guidance: Drainage Maintenance and Construction (Brew and Gilligan, 2019) sets out how Drainage Maintenance and Construction work is to be carried out. The guidance document includes procedures which are instructions to help OPW staff, in the form of a practical handbook. The Guidance aims to deliver good drainage and flood relief functions while reducing the associated environmental impacts. The Environmental Procedures (EPs) set out in this book include a range of standard mitigation and are compulsory on OPW projects. These compulsory EPs provide a basic level of Environmental Mitigation, and are considered to be embedded in the project, so are included in the project description, rather than being considered as 'avoidance or reduction' measures which could only be considered in the Appropriate Assessment (Stage 2). Some EPs are not compulsory on all schemes and these are considered to be 'avoidance or reduction' measures and are not considered until later.

Table 3-2: Relevant Drainage Maintenance Procedures and whether these are a description of the project, or mitigation measures

Procedure	Project Description, Mitigation, or other	Notes
Section 1A: Drainage Maintenance Planning Procedures		
EP1 Annual Programme	Project Description	Applies to all maintenance.
EP2 Environmental Risk Assessment	Project Description	Applies to all works to identify if included in the project description of the Appropriate Assessment.
EP5 Drainage Maintenance Environmental Management	Project Description	This procedure is for communication of environmental management and any mitigation measures with onsite staff and others implementing drainage maintenance activity.

Procedure	Project Description, Mitigation, or other	Notes
Section 1B: Drainage Maintenance Implementation Procedures		
EP7 Environmental Drainage Maintenance	Project Description	<p>This procedure describes how typical maintenance of channels and embankments is to be carried out.</p> <p>Included are some seasonal restrictions on activities, which are requirements of other legislation:</p> <ul style="list-style-type: none"> - No maintenance within coarse fish channels from 1st April to 1st July. - Tree cutting window from 1st September to 28th February. - Work in gravel bed channels only between 1st July and 30th September. <p>The procedure also sets the annual audit process of maintenance activity.</p>
Section 2: Construction Procedures		
EP15 Construction Silt Management	Project Description	Measures to ensure the reduction in artificial sources of silt from total silt load of water bodies includes consideration for set up and operation with measures including silt interception.
EP17 Water Pollution	Project Description	This procedure relates to all work (maintenance and construction) beside water bodies. It sets control measures to protect water bodies from pollution sources associated with works and machinery.
Section 3: Invasive Species Procedures		
EP18A Standard Biosecurity	Project Description	This is a minimum requirement for all works.
EP18B High Biosecurity	Mitigation	This procedure for enhanced biosecurity measures is dependent upon location.
Section 4: Animal and Plant Procedures		
EP19 Salmonid	Mitigation	<p>GIS layers are used to identify if species are likely to be encountered, however the species could occur in locations not already identified. If species or habitats are observed by maintenance staff then the full procedure applies.</p> <p>These procedures only apply to certain channels and embankments and so do not apply to all maintenance activity.</p> <p>Seasonal restrictions are already set in EP7.</p>
EP20 Otter		
EP21 Lamprey		
EP22 Crayfish		
EP23 Badger		
EP24 Bank Nesting Birds		
EP25 Birds		
EP26 Bats		
EP27 Rare Plants		
EP28 Freshwater Pearl Mussel		
Habitat Procedures		
EP30 Alluvial (Wet Woodland)	Mitigation	<p>GIS layers are used to identify if habitats are likely to be encountered, however the habitats could occur in locations not already identified. If habitats are observed by maintenance staff then the full procedure applies.</p>
EP31 Wetland		
EP33 Floating River		

Procedure	Project Description, Mitigation, or other	Notes
Vegetation Habitat		These procedures only apply to certain channels and embankments and so do not apply to all maintenance activity.

3.3.4 Working Hours

All maintenance activities are undertaken during daylight hours. Standard working hours are 8.00am to 4.30pm, with lunch and tea breaks, Monday to Friday. There is no requirement for temporary site lighting to facilitate works. Machines are powered down when not in use.

3.4 Project Zone of Influence

The project zone of influence for this screening is based on the screening tables in Ryan Hanley (2014a). An initial screening is based on surface water catchments, groundwater bodies or a physical footprint plus 600m buffer, that are used to identify sites with potential ecological connectivity to the scheme, and subsequently these sites are screened using the criteria for each pathway listed in Ryan Hanley (2014a,b) to determine if there are any likely significant effects which need further consideration.

4 Ecology Baseline

4.1 Overview

This section summarises the baseline information about the environment within the project footprint. This is based on a review of the information listed in Section 2.1. No site visit was carried out for this assessment.

4.2 Qualifying interests

Records from NBDC (2021) mapping were compiled to identify any Qualifying Interests that may be recorded within 2km or located within the relevant catchment.

White-clawed Crayfish *Austopotamobius pallipes* has been recorded 1km away, at the Gorteen Bridge on Ballinacurra stream, the next downstream tributary to C1/46.

Evidence of Otter *Lutra lutra* has been recorded at Ballinacurra in 1980s, approximately 300m downstream on the Moy. It was noted with this record that there was very little vegetation for Otter. More recent records have been recorded downstream on the Moy, and it is likely this species is present in channel C1/46.

The channel is identified as an important salmonid channel in OPW's records.

4.3 Surrounding landscape and habitat

The surrounding landscape either side of bridge UB1 is dominated by agricultural fields, some of the boundaries are bordered by treelines, although upstream of the bridge the land is composed of forestry plantation and cutover bogs. The channel C1/46 is a minor watercourse approximately 2m wide (Figure 4-1) with little riparian vegetation and outfalls into the River Moy 190m downstream of the bridge.



Figure 4-1: Channel C1/46 and box culvert bridge UB1. (Image provided by OPW).

4.4 Non-native Invasive Species

No Non-native Invasive Species (NNIS) were noted by OPW in the vicinity of the bridge.

5 Screening Assessment

This Screening Assessment was conducted in line with guidance produced for the OPW in 2014 (Ryan Hanley, 2014a; 2014b). This methodology is based on source > pathway > receptor chain principles and involves assessing likely significant effects on European sites within the zone of influence of the proposed drainage maintenance in relation to three pathways:

1. Surface water
2. Land & air
3. Groundwater

The Screening involved assessing the potential impacts of drainage maintenance operations within the arterial drainage scheme, and its zone of influence (ZOI), in relation to each of the three pathways. The ZOI varies for each pathway in order to ensure that only relevant site and impact combinations are considered. Although there is no upper limit on the ZOI, it is rarely beyond 5km (Section 3.4) and for some land and air impact pathways it is as little as 10m. Conclusions were then drawn to identify if maintenance works could impact upon European sites.

Figure 5-1 below shows the surface water catchment and pathways from the site to the European site.

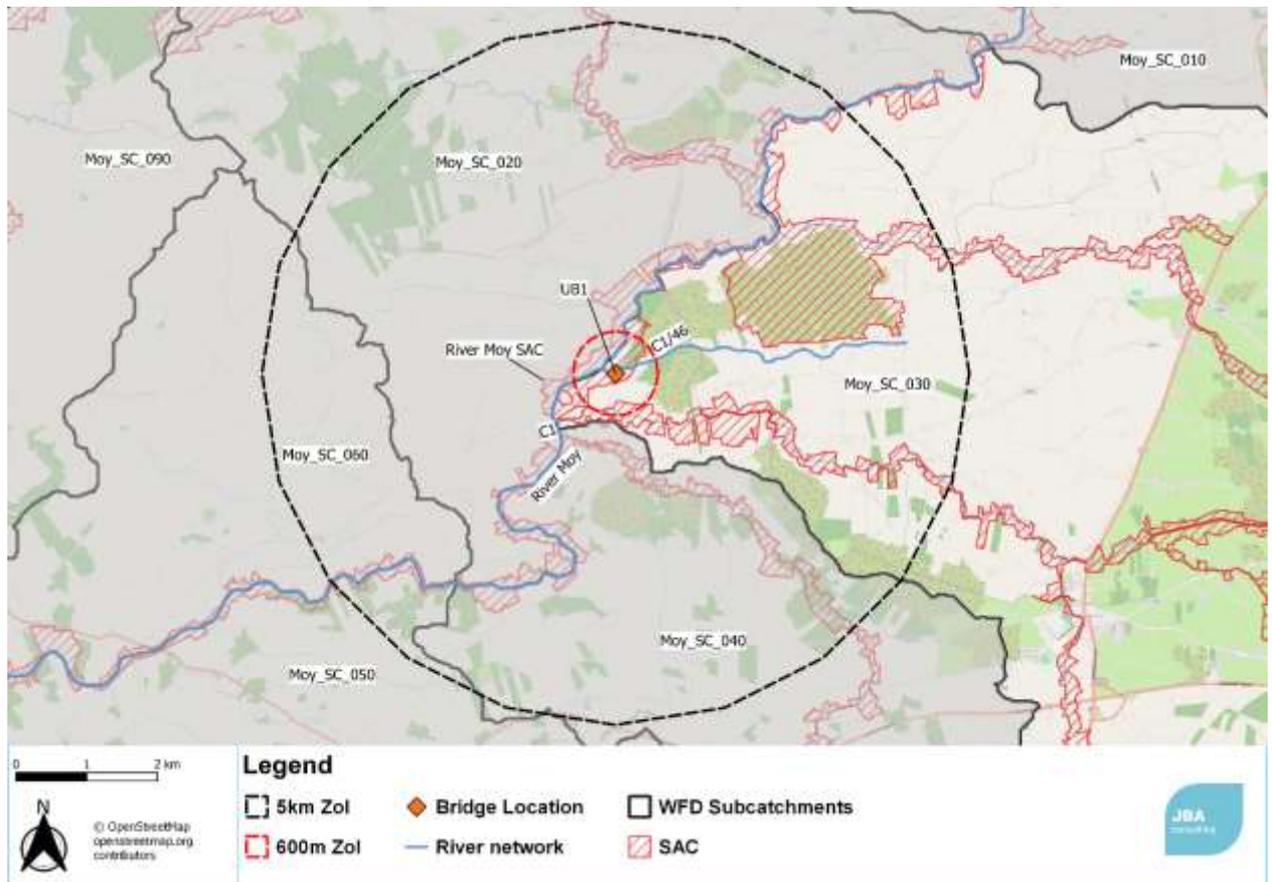


Figure 5-1: European sites surface water catchment and pathway and 600m buffer for Air impacts.

5.1 Surface Water Pathways

The surface water pathways are based on river catchments. The bridge is located primarily within the Moy_SC_030 Water Framework Directive (WFD) sub-catchment.

River Moy SAC is the only European site within the same surface water catchment within 5km as the bridge (Table 5-1). The European site has surface water connectivity with the Scheme.

Table 5-1: Surface Water Pathways

European Site (Site Code)	Is site within the same surface water catchment as the scheme?	Is there surface water connectivity with the scheme?
River Moy SAC (002298)	Yes	Yes

Pre-determined distances and typologies (Ryan Hanley, 2014b) were used to define the ZoI of the works and determine potential and significance of impacts on individual QI features of the site. Information, including from the Conservation Objectives, was also reviewed to determine the location of the drainage maintenance activities relative to the Surface Water Dependent (SWD) QIs. Where no information on the location of SWD Qualifying Interests was available, the precautionary principle was applied and the QIs were screened in. The results of this are summarised in Table 5-2 and show if a Likely Significant Effect (LSE) will occur.

Table 5-2: Summary results of SWD QIs of SACs with potential surface water pathways, potential Annex I habitats present and potential for significant impact

SWD QI [EU Code]	Project activity location relative to SWD QI	Desktop Study Comment	Conclusion
River Moy SAC (002298)			
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0]	>5km away	Along the channel between Ballimore Lough and the main River Moy.	No LSE
Alkaline fens [7230]	>5km away	Around Mannin Lake and also adjacent to the River Moy near Ballintemple.	No LSE
<i>Austropotamobius pallipes</i> White-clawed Crayfish [1092]	Possibly present at site	Widespread throughout the SAC.	Potential LSE
<i>Petromyzon marinus</i> Sea Lamprey [1095]	Possibly present at site	Regularly recorded in the lower stretches of River Moy around Ballina.	Potential LSE
<i>Lampetra planeri</i> Brook Lamprey [1096]	Possibly present at site	Distribution not mapped.	Potential LSE
<i>Salmo salar</i> Salmon [1106]	Possibly present at site	Widespread throughout the SAC.	Potential LSE
<i>Lutra lutra</i> Otter [1355]	Possibly present at site	Widespread throughout the SAC.	Potential LSE

The screening has identified that one European site is within the relevant screening distances and could potentially be impacted via surface water pathways. In summary, QIs of the following European sites are at risk from likely significant adverse effects and require further assessment:

River Moy SAC

- *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 Land and air pathways

The relevant ZoI for land and air pathways from drainage schemes is 0.01km to 0.6km (Ryan Hanley, 2014b). As a result of this, the scheme has the potential to impact on the European sites shown in Table 5-3 via Land and Air Pathways.

Table 5-3: Land and air pathways

European Site Name (Site Code)	0.6km Buffer Zone	0.01km (Overlap)
Type of Impact	Indirect impacts for noise and visual disturbance through air pathways	Direct impacts from physical disturbance of habitats through land pathways
River Moy SAC (002298)	Yes	Yes

The distribution of habitats is taken from a combination of published NPWS data. Summary results of QIs with potential for likely significant effects by land and air pathways are shown for the Natura site in Table 5-4.

Table 5-4: Summary results of QIs / FOIs with potential land and air connectivity

Land and Air QI	Project activity location relative to QI	Desktop Study Comment	Conclusion
Lough Corrib SAC			
Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	>0.6km/0.01km away	Mapped on west edge of Lough Conn	No LSE
Active raised bogs [7110]	>0.6km/0.01km away	There are five raised bogs listed for River Moy SAC. Cloongoonagh Bog is located 1.8km away	No LSE
Degraded raised bogs still capable of natural regeneration [7120]	>0.6km/0.01km away	Associated with Active Raised Bogs [7110]	No LSE
Depressions on peat substrates of the Rhynchosporion [7150]	>0.6km/0.01km away	Associated with Active Raised Bogs [7110]	No LSE
Lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>) [6510]	>0.6km/0.01km away	Listed as a QI but no conservation objective exists. Located near Foxford	No LSE
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0]	>0.6km/0.01km away	Mapped on west edge of Lough Conn	No LSE

Land and Air QI	Project activity location relative to QI	Desktop Study Comment	Conclusion
Alkaline fens [7230]	>0.6km/0.01km away	Around Mannin Lake and also adjacent to the River Moy near Ballintemple.	No LSE
<i>Austropotamobius pallipes</i> White-clawed Crayfish [1092]	Possibly present at site	Widespread throughout the SAC.	Potential LSE
<i>Petromyzon marinus</i> Sea Lamprey [1095]	Possibly present at site	Regularly recorded in the lower stretches of River Moy around Ballina.	Potential LSE
<i>Lampetra planeri</i> Brook Lamprey [1096]	Possibly present at site	Distribution not mapped.	Potential LSE
<i>Salmo salar</i> Salmon [1106]	Possibly present at site	Widespread throughout the SAC.	Potential LSE
<i>Lutra lutra</i> Otter [1355]	Possibly present at site	Widespread throughout the SAC.	Potential LSE

The screening has identified that one European site is within the relevant screening distances and could potentially be impacted via land and air pathways. In summary, QIs of the following European sites are at risk from likely significant adverse effects and require further assessment:

River Moy SAC

- *Austropotamobius pallipes* White-clawed Crayfish [1092]
- *Petromyzon marinus* Sea Lamprey [1095]
- *Lampetra planeri* Brook Lamprey [1096]
- *Salmo salar* Salmon [1106]
- *Lutra lutra* Otter [1355]

5.3 Groundwater pathways

The proposed project primarily involves working at a watercourse or next to a watercourse. Excavations will be no deeper than existing level of the riverbed. Any water discharged locally to the ground would drain to the stream and return to surface and would not enter the groundwater body in significant quantity. This means that the potential for impacts to be transmitted via groundwater are negligible and groundwater impacts are screened out from further assessment.

5.4 Screening assessment conclusion

The screening assessment identified one European site within the ZOI of the Scheme. The screening assessed this site for potential for significant impacts from the proposed works of the Scheme, using the source-pathway-receptor model (Ryan Hanley, 2014a) and identified that there are likely significant effects requiring further assessment on the River Moy SAC (Table 5-5). An Appropriate Assessment is therefore required.

Table 5-5 Conclusions of screening assessment for likelihood of significant effect

Site	Pathway of Impact			Comment
	Surface Water	Land and Air	Ground water	
River Moy SAC (002298)	Yes	Yes	No	There is potential for the QIs of this European site to be impacted by surface water and land and air pathways given that the species present have connectivity to surface water and are likely to occur throughout the SAC.

6 European Sites

Two sites were identified by the Screening Assessment as having likely significant effects as a result of proposed bridge repair. This section presents more detail on the sites and its QIs, with details of the conservation objectives given in Appendix A. These were already taken into account in the screening assessment but are presented here to provide full clarity on the basis for the Stage 2 assessment.

6.1 River Moy SAC (002298)

The River Moy SAC comprises almost the entire freshwater element of the River Moy and its tributaries including Lough Conn and Lough Cullin. The system drains a catchment area of 805 km². The largest area of the SAC is located in Co. Mayo, although parts are in west Sligo and north Roscommon. Apart from the River Moy itself, other rivers included within the site are the Deel, Bar Deela, Castlehill, Addergoole, Clydagh and Manulla on the west side, and the Glenree, Yellow, Strade, Gweestion, Trimogue, Sonnagh, Mullaghanoe, Owengarve, Eighnagh and Owenaher on the east side. 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. Some of the tributaries at the east, the south of Lough Conn and all of Lough Cullin are underlain by granite. There are many towns adjacent to but not within the site. These include Ballina, Crossmolina, Foxford, Swinford, Kiltimagh and Charlestown (NPWS, 2020b).

The River Moy and Lough Conn are one of Ireland's premier Salmonid river and lake systems (NPWS 2020b).

6.1.1 Qualifying interests

River Moy SAC is selected for the following seven habitats and five species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are European codes) (NPWS, 2016):

- Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510]
- 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]

Not all of the qualifying features of the SAC occur in the ZoI of the proposed works. The QIs that could be potentially present in the vicinity and therefore have the potential to be significantly impacted through water quality and/or disturbance include:

- *Austropotamobius pallipes* White-clawed Crayfish [1092]
- *Petromyzon marinus* Sea Lamprey [1095]
- *Lampetra planeri* Brook Lamprey [1096]
- *Salmo salar* Salmon [1106]

- *Lutra lutra* Otter [1355]

6.1.2 Site Vulnerabilities

The main threats to the quality of this site are from water polluting activities resulting from intensification of agricultural activities and diffuse pollution to surface waters due to agricultural activities, including spreading of slurry and fertilisers, and forestry activities resulting in sedimentation and acidification. Introduction of invasive non-native species, such as exotic crayfish species or the crayfish fungal plague (*Aphanomyces astaci*) could have a serious impact on the native crayfish population. (NPWS, 2020a; 2020b)

6.1.3 Conservation Objectives

The conservation objectives for the qualifying interests of the SAC that are of relevance to this NIS are detailed the following sections.

6.1.3.1 White-clawed Crayfish *Austropotamobius pallipes*

White-clawed Crayfish is widespread throughout River Moy SAC, including the tributaries of River Moy (NPWS, 2020b). The conservation objectives for this species are to maintain the favourable conservation condition of White-clawed Crayfish in River Moy SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Distribution	Occurrence	No reduction from baseline
Population structure: recruitment	Occurrence of juveniles and females with eggs	Juveniles and/or females with eggs in all occupied tributaries
Negative indicator species	Occurrence	No alien crayfish species
Disease	Occurrence	No instances of disease
Water quality	EPA Q value	At least Q3-4 at all sites sampled by EPA
Habitat quality: heterogeneity	Occurrence of positive habitat features	No decline in heterogeneity or habitat quality

6.1.3.2 Sea Lamprey *Petromyzon marinus*

Sea Lamprey is regularly encountered in the lower stretches of the river around Ballina (NPWS, 2020b). The conservation objectives for this species are to maintain the favourable conservation condition of Sea Lamprey in River Moy SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Distribution: extent of anadromy	Percentage of river accessible	Greater than 75% of main stem length of rivers accessible from estuary
Population structure of juveniles	Number of age/size groups	At least three age/size groups present
Juvenile density in fine sediment	Juveniles/m ²	Mean catchment juvenile density at least 1/m ²
Extent and distribution of spawning habitat	m ² and occurrence	No decline in extent and distribution of spawning beds

Attribute	Measure	Target
Availability of juvenile habitat	Number of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive

6.1.3.3 Brook Lamprey *Lampetra planeri*

The conservation objectives for this species are to maintain the favourable conservation condition of Brook Lamprey in River Moy SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Distribution	Percentage of river accessible	Access to all watercourses down to first order streams
Population structure of juveniles	Number of age/size groups	At least three age/size groups of brook/river lamprey present
Juvenile density in fine sediment	Juveniles/m ²	Mean catchment juvenile density of brook/river lamprey at least 2/m ²
Extent and distribution of spawning habitat	m ² and occurrence	No decline in extent and distribution of spawning beds
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive

6.1.3.4 Salmon *Salmo salar*

The Moy system is one of Ireland's premier salmon waters. The Moy is a most productive catchment in salmon terms and this can be attributed to its being a fingered system with a multiplicity of 1st to 5th order tributaries which are large enough to support salmonids <2 years of age while at the same time being too small to support significant adult trout numbers and are therefore highly productive in salmonid nursery terms (NPWS, 2020b).

The conservation objectives for this species are to maintain the favourable conservation condition of Salmon in River Moy SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Distribution: extent of anadromy	Percentage of river accessible	100% of river channels down to second order accessible from estuary
Adult spawning fish	Number	Conservation Limit (CL) for each system consistently exceeded
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling
Out-migrating smolt	Number	No significant decline

Attribute	Measure	Target
abundance		
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA

6.1.3.5 Otter *Lutra lutra*

Otter is widespread throughout River Moy SAC (NPWS, 2020b). The conservation objectives for the species are to maintain the favourable conservation condition of Otter in River Moy SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Distribution	Percentage positive survey sites	No significant decline
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 1068.8ha
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 479.4km
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 1248.2ha
Couching sites and holts	Number	No significant decline
Fish biomass available	Kilograms	No significant decline
Barriers to connectivity	Number	No significant increase. For guidance

7 Stage 2 Appropriate Assessment

7.1 Introduction

The following chapter assesses the screened in European sites in more detail and examines where adverse impacts may arise from the sources of impact identified above. The full impact assessment on these features is below. The screened in European sites are:

- River Moy SAC

7.2 Identification of Potential Sources of Impact

This section further examines the source > pathway > receptor chains that could potentially result in adverse impacts arising on the screened in European sites in the Moy Arterial Drainage Scheme; this is informed primarily by Ryan Hanley (Ryan Hanley, 2014b). Table 5-5 details which of the possible pathways of impact (i.e. surface water, and land and air) have been identified as potentially affecting the screened in European sites.

7.2.1 Identification of Potential Sources of Impact via Surface Water Pathways

Release of suspended solids - this is most likely to occur as a result of sediment being released when the channel is dammed and water is directed through a constructed diversion channel and also when the works are finished and the dam is removed and the diversion channel is filled. It may also occur where rainfall events wash disturbed soil from the ground and soil stockpiles into the watercourse.

The suspended solids impact on surface water dependent habitats and species indirectly through increased turbidity, which can reduce photosynthesis levels and habitat quality. This can then impact upon species within the river (Otter [1355], Salmon [1106], Crayfish [1092], Lamprey species [1095] [1096]) by reducing food availability and habitat quality through changed water quality and riverbed conditions.

The possibility of silt being released is controlled by EP15 (Brew & Gilligan, 2019) which will be implemented as standard and is therefore part of the project description. This EP includes a risk assessment process to identify the main sources of silt and put in place measures to minimise the amount of suspended solids. The EP specifies measures for the main channel, diversion channels, vehicle movements and storage areas. The implementation of this EP means that large volumes of silt will not be mobilised to the channel through careless working practices.

Release or changes in nutrient levels/pollutants – this is most likely to occur as a result of the nutrients currently trapped in sediment being released during the works, through release of cement washings, or through spillages or leaks of contaminative material from machinery. It can impact on surface water dependent species and habitats indirectly, causing eutrophication and reducing water quality. It can also impact indirectly on species such as Otter [1355], Salmon [1106], Crayfish [1092], Lamprey species [1095] [1096] for example through reduced water clarity from eutrophication causing algal growth, or reduced water quality. This could also impact on Otter by impacting upon food sources (i.e. fish/crayfish as prey) or hunting ability from lower water clarity.

Release of pollutants – this would be a construction impact due to vehicles and site compound locations creating a local release of polluting material. The OPW procedures are in place to manage these impacts. These procedures would mean that the possibility of a pollution event occurring is very low and if such an event occurred it would be very small and quickly dealt with and the effects on the site would therefore be negligible. This impact is therefore not considered further.

Changes in water levels/channel morphology – the works on the culvert bridge will be in the same footprint. The water level in the dammed section of the channel will be changed temporarily but this is not expected to change the levels in stream if the channel is diverted or pumped. The current channel morphology has developed while the bridge is in place and the replacement of this bridge will be constructed in the same footprint and not expected to cause changes to channel morphology

7.2.2 Potential Sources of Impact via Land and Air Pathways

Direct habitat loss and physical disturbance – The project to replace the culvert bridge will involve the temporary loss of habitat in the River Moy SAC. This temporary loss will be at the bridge footprint as well the area that will be dammed and dewatered either through over-pumping or diversion channel, approximately 50m of the river.

The instream area up- and downstream of the bridge may be host to the Qualifying Interest species of the River Moy SAC such as Otter [1355], Salmon [1106], Crayfish [1092], Lamprey species [1095] [1096]. If Crayfish, Salmon and/or Lamprey species are present in this channel there may be direct mortalities and displacement of these species during the damming and de-watering process. It is not expected that otter will be impacted in the same way but may be displaced temporarily during the works.

Works have been programmed between July and September to avoid Salmonid spawning season and it is expected that the channel will be dammed for no more than 2 weeks. This is also considered the time of least disturbance to reproducing Brook Lamprey and White-clawed crayfish. It is unlikely Sea Lamprey will be in this channel in even moderate numbers.

EP15 outlines the following procedures to protect in-stream fauna during damming:

- Use ecological assistance when dewatering behind cofferdams or temporary diversions, translocation of specific species maybe required.
- Ensure works area within waterbody does not become dry in an unmanaged fashion, killing fish or other aquatic species.

If there is >10cm water in the channel it is recommended (as detailed in EP15) that diversion of the channel during the works is the preferred option, instead of over-pumping to allow continued fish passage. Flow should be transferred to the bypass in a carefully managed way, translocating relevant aquatic species using a bucket of water, to a point up or downstream that is clear of sediment, ensuring the downstream watercourse does not run dry, while taking into account fish passage and appropriate design flow.

Considering the temporary nature of the works, the timing of the works, and the procedures to protect and translocate aquatic species during the works, with the preferred option to divert the channel if aquatic species are present, significant impacts to in-stream qualifying interests at the site of the bridge replacement works is not anticipated.

Noise and visual disturbance – this will specifically impact otter, which would particularly be disturbed by noise and presence of humans, which could displace these animals from the riparian habitats within the SAC. However the surrounding area does not appear to be particularly suitable for otter holts or resting places, due to the openness and lack of vegetation along the channel, and are more likely to present on the River Moy. Additionally, otters are very mobile and would be expected to avoid works areas. The noise and visual disturbance would be limited to the daytime (works will be carried out from 8am-4pm only), with Otters mainly active overnight.

Therefore, due to the temporary nature of the works, and no disturbance at nighttime, and lack of suitable habitat for holts, there will be no significant impact to these qualifying interests because of the bridge replacement works.

7.2.3 Potential sources of Impact via Groundwater Pathways

No potential impacts were identified via groundwater pathways, as described in Section 5.3.

7.2.4 Do nothing impact

The do nothing impact is always subject to a significant amount of uncertainty. In the absence of other intervention the do nothing option is likely to involve failure of the bridge and increase the potential for a serious safety incident, resulting in the requirement for more significant, possibly emergency, intervention at a later date where there might be little control on the timing of the works.

7.3 Impact Evaluation

Table 7-1 evaluates the screened in European sites and potential impacts as discussed in Section 7.2 in more detail and examines where potentially adverse impacts may arise from the sources identified above. Where potentially significant adverse impacts are identified, avoidance and mitigation measures are proposed to offset these impacts. Impacts are identified as 'no adverse impact' where detailed consideration shows no impact, or the mitigation prevents any impact.

Mitigation measures required to prevent adverse impacts include those described in the OPW EPs which are not considered to be project mitigation. More detailed measures are defined where necessary and are described in detail in Table 7-1 and in Section 7.4.

Table 7-1 Impact evaluation table for screened in QI/SCI and pathways

Qualifying Interest	Potential Source of Impact	Relevant COs to impact	Impact on Attribute and Target Prior to Mitigation / Avoidance	Avoidance / Mitigation Measures	Residual Impact
River Moy SAC					
<i>Austropotamobius pallipes</i> White-clawed Crayfish [1092]	Release of suspended solids <i>Surface water</i>	Distribution; Population structure; Water quality; Habitat quality	<p>These species are all present throughout the River Moy SAC and may occur in the channel.</p> <p>Compliance with the EP 15 and 17 that apply to construction activities means that the impact on water quality will be minimised in the channel. Additionally, works have been scheduled between July and September only to avoid salmonid spawning. Inland Fisheries Ireland will be consulted with prior to works commencing to ensure that there are no issues with fish movement in the channel.</p> <p>With the EPs in place there should be no impacts on surface water quality that would result in impacts on these species. Specific mitigation to ensure no release of sediment is outlined.</p>	<p>The site compound will be set back from the channel in an agricultural field at least 30m back from the top of the bank. All refuelling should be carried out in this compound.</p> <p>The works will be postponed if sustained heavy rain is forecasted at the time/within 24 hours of activities with the highest risk of sediment release which are excavation and infilling of bypass channel.</p> <p>Spoil and excavated materials, particularly if the diversion channel option goes ahead, should be stored more than 3m from the working bank and separated from the channel by a buffer of vegetation or a constructed silt interceptor. Spoil will be covered by a tarpaulin as needed to control sediment released by rainfall.</p>	No adverse impact
<i>Petromyzon marinus</i> Sea Lamprey [1095]	Release or changes in nutrient levels/pollutants <i>Surface water</i>	Distribution; Population structure of juveniles; Extent and distribution of spawning habitat; Availability of spawning habitat			No adverse impact
<i>Lampetra planeri</i> Brook Lamprey [1096]		Adult spawning fish; Salmon fry abundance; Out-migrating smolt abundance; Number and distribution of redds; Water quality			No adverse impact
<i>Salmo salar</i> Salmon [1106]					
<i>Lutra lutra</i> Otter [1355]					
<i>Austropotamobius pallipes</i> White-clawed Crayfish	Changes in water levels / channel	Distribution; Population structure;	The species for which the River Moy SAC is designated are dependent on specific aquatic and riparian habitats, which	N/A	No adverse

Qualifying Interest	Potential Source of Impact	Relevant COs to impact	Impact on Attribute and Target Prior to Mitigation / Avoidance	Avoidance / Mitigation Measures	Residual Impact
[1092]	morphology <i>Surface water</i>	Water quality; Habitat quality	require maintenance of appropriate hydrological regimes.		impact
<i>Petromyzon marinus</i> Sea Lamprey [1095] <i>Lampetra planeri</i> Brook Lamprey [1096]		Distribution; Population structure of juveniles; Extent and distribution of spawning habitat; Availability of spawning habitat	The water level in the dammed section of the channel will be changed temporarily but this is not expected to change the levels in stream if the channel is diverted or pumped. The current channel morphology has developed while the bridge is in place and the replacement of this bridge will be constructed in the same footprint and not expected to cause changes to channel morphology		No adverse impact
<i>Salmo salar</i> Salmon [1106]		Adult spawning fish; Salmon fry abundance; Out-migrating smolt abundance; Number and distribution of redds; Water quality			No adverse impact
<i>Lutra lutra</i> Otter [1355]		Distribution; Extent of freshwater (river) habitat; Fish biomass available			No adverse impact
1092 <i>Austropotamobius pallipes</i> White-clawed Crayfish	Direct habitat loss and physical disturbance	Distribution Population structure: recruitment Habitat quality: heterogeneity			The species for which the River Moy SAC is designated are dependent on rivers being accessible and population distribution not being obstructed up or downstream. The replacement of the bridge will require damming of the watercourse and either



Qualifying Interest	Potential Source of Impact	Relevant COs to impact	Impact on Attribute and Target Prior to Mitigation / Avoidance	Avoidance / Mitigation Measures	Residual Impact
1355 <i>Lutra lutra</i> Otter		Distribution Barriers to connectivity	over-pumping of the channel water or a diversion channel. This could have adverse impacts on these species in the SAC at the area the bridge is being replaced in the channel, and prevent these species from using the watercourse over the course of the works. Considering the temporary nature of the works, the timing of the works, and the procedures to protect and translocate aquatic species during the works, with the preferred option to divert the channel if aquatic species are present, significant impacts to in-stream qualifying interests at the site of the bridge replacement works is not anticipated.	High biosecurity measures will be implemented as set out in EP18.	
1106 <i>Salmo salar</i> Salmon		Distribution (% of river accessible) Number and distribution of redds			
1095 <i>Petromyzon marinus</i> Sea Lamprey 1096 <i>Lampetra planeri</i> Brook Lamprey		Distribution Extent and distribution of spawning habitat Availability of juvenile habitat			
1355 <i>Lutra lutra</i> Otter	Noise and visual disturbance	Distribution	Therefore, due to the temporary nature of the works, and no disturbance at night-time, and lack of suitable habitat for holts, there will be no significant impact to these qualifying interests because of the bridge replacement works	N/A	No adverse impact

7.4 Site specific mitigation measures

Specific mitigation measures are identified in Table 7-1 as necessary in order to reduce and avoid the identified potential impacts on the above European site; these measures are detailed in Table 7-2.

Table 7-2. Specific mitigation measures

Potential Impact	Specific Avoidance and Mitigation Measures
<p>Release of suspended solids and release or changes in nutrient levels on:</p> <p><i>Petromyzon marinus</i> Sea Lamprey <i>Lampetra planeri</i> Brook Lamprey <i>Salmo salar</i> Salmon <i>Austropotamobius pallipes</i> White-clawed Crayfish <i>Lutra lutra</i> Otter</p>	<p>The site compound will be set back from the channel in an agricultural field at least 30m back from the top of the bank. All refuelling should be carried out in this compound.</p> <p>The works will be postponed if sustained heavy rain is forecasted at the time/within 24 hours of activities with the highest risk of sediment release which are excavation and infilling of bypass channel.</p> <p>Spoil and excavated materials, particularly if the diversion channel option goes ahead, should be stored more than 3m from the working bank and separated from the channel by a buffer of vegetation or a constructed silt interceptor. Spoil will be covered by a tarpaulin as needed to control sediment released by rainfall.</p> <p>Rationale: These measures will help reduce as far as possible the quantity of suspended solids and nutrients that could potentially be released into the water.</p> <p>Confidence: The measures would form part of the work Method Statement and are simple measures that could be implemented with a high degree of confidence.</p>
<p>Direct habitat loss and physical disturbance</p> <p><i>Petromyzon marinus</i> Sea Lamprey <i>Lampetra planeri</i> Brook Lamprey <i>Salmo salar</i> Salmon <i>Austropotamobius pallipes</i> White-clawed Crayfish <i>Lutra lutra</i> Otter</p>	<p>If there is >10cm water in the channel it is recommended (as detailed in EP15) that diversion of the channel during the works is the preferred option. Translocation of aquatic species should be carried out as the channel is dewatered.</p> <p>High biosecurity measures will be implemented as set out in EP18.</p> <p>Rationale: These measures will help reduce as far as possible the barriers and direct mortalities to aquatic species during the works.</p> <p>Confidence: The measures would form part of the work Method Statement and are simple measures that could be implemented with a high degree of confidence.</p>

7.4.1 Mitigation Provided by Optimum Timing of Works

Works are scheduled to take place within the summer months when lower amounts of rainfall occurs, and the flow is likely to be low or absent.

7.5 Impact on Site Integrity

The residual impacts identified in Table 7-1 could adversely impact overall site integrity. This is set out in Table 7-3 and Table 7-4.

Table 7-3: Integrity of Site Checklist- Conservation Objectives

Conservation objectives: does the project or plan have the potential to:	Yes or No and explanation
Cause delays/interruption in progress towards achieving the conservation objectives of the sites?	No – The area and distribution of habitats will not be altered by the works. No habitats are expected to decline in area.
Disrupt those factors that help to maintain the favourable conditions of the site?	No - there is no obvious mechanism for this type of impact.
Interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the site?	No - The community composition of macrofaunal species is not expected to be impacted by the works due to the small scale of the works and the fact that there will be no permanent loss or change of habitat and the works are to restore the normal function of existing drainage features.

Table 7-4: Integrity of Site Checklist- Other Objectives

Other objectives: does the project or plan have the potential to:	Yes or No
Cause changes to the vital defining aspects (e.g. nutrient balance) that determine how the site functions as a habitat or ecosystem?	No – the proposed works are not expected to alter the levels of sediment within the river system. Therefore, the works will not disrupt the normal functioning of sediment supply and cycling.
Change the dynamics of the relationships (between, for example, soil and water or plants and animals) that define the structure and/or function of the site?	No – there is no obvious mechanism for this type of impact.
Interfere with predicted or expected natural changes to the site (such as water dynamics or chemical composition)?	No - there is no obvious mechanism for this type of impact.
Reduce the area of key habitats?	No – no permanent habitat loss is expected due to the proposed works.
Reduce the population of key species?	No – no long-term impacts on populations of key species are expected, with only temporary displacement during works.
Change the balance between key species?	No – the balance between species is not expected to be permanently impacted.
Reduce diversity of the site?	No – overall diversity on site is likely to remain unchanged.
Result in disturbance that could	No – there is no clear mechanism for this type of

Other objectives: does the project or plan have the potential to:	Yes or No
affect population size or density or the balance between key species?	impact.
Result in fragmentation	No – no habitat fragmentation is expected due to the proposed works.
Result in loss or reduction of key features (e.g. tree cover, tidal exposure, annual flooding etc.)?	No – no reduction in key features is expected due to the proposed works.

8 Other Relevant Plans and Projects

8.1 Cumulative effects

As part of the Appropriate Assessment other relevant projects and plans in the region that may result in impacts in-combination with the Scheme are considered at this stage. The residual effects identified for River Moy SAC are:

- Temporary, negligible impacts to surface water dependant QIs

The scale of impacts to water quality is likely to be very small and temporary (4-5 weeks to complete works). Only projects on or directly adjacent to the River Moy or the main tributaries within 5km of the proposed works were included in the in-combination assessment, as these would be the only other projects that could cause additional impacts to water quality.

The following active projects or plans were identified as potential sources of cumulative impacts:

- Mayo County Development Plan 2014-2020
- River Basin Management Plan for Ireland 2018-2021
- Moy Arterial Maintenance Drainage Scheme 2016-2020
- Moy Arterial Maintenance Drainage Scheme 2021-2026
- Environmental Impact Assessment (EIA) and Local Planning Applications

8.2 Plans

8.2.1 Mayo County Development Plan 2014-2020

The Mayo County Development Plan sets out development strategies for a sustainable and economic growth. In the making of the plan, a Habitats Directive Assessment (HDA) was carried out to find any likely impacts the Plan might have on the European network. The findings concluded that some material alterations to the Plan would have a significant effect on one or more European sites, in the view of the sites' conservation objectives. Variation No. 1 of the Plan was produced to address and amend these issues. Variation No. 1 is not considered to have a significant effect on any European sites, either alone or in combination with other plans or projects. Variation No. 2 of the Plan facilitates the application for the Urban Regeneration and Housing Act 2015 and is not considered to have a significant effect on the integrity of any European sites (Mayo County Council, 2014).

The core strategy includes policies to facilitate regional development by increasing services such as public transport, amenities and water services infrastructure which will contribute to attractive settlements. The Plan also aims to enhance and facilitate access to the natural environment and recreational areas. The Plan states that any development that is to be carried out, is to be undertaken in a sustainable manner and demonstrate that it will not have a significant effect on any European sites (Mayo County Council, 2014).

If this plan has no adverse effects alone it cannot have any effects in combination with the proposed works in this assessment.

Mayo County Development Plan 2021-2027 is still a draft and has not yet been adopted (Mayo County Council, 2021).

8.2.2 River Basin Management Plan for Ireland 2018-2021

The River Basin Management Plan (RBMP) for Ireland 2018-2021 sets out the actions that Ireland will take to improve water quality and achieve 'good' ecological status in water bodies (rivers, lakes, estuaries and coastal waters) by 2021 (DoHPLG, 2018a). The major change from previous River Basin Management Plans is that all River Basin Districts are now merged as one national River Basin District. The Plan provides a more coordinated framework for improving the quality of our waters — to protect public health, the environment, water

amenities and to sustain water-intensive industries, including agri-food and tourism, particularly in rural Ireland.

The River Basin Management Plan for Ireland (2018-2021) aims to improve the management and water quality of over 700 water bodies in Ireland. An Appropriate Assessment of the plan was undertaken, identifying that the measures proposed are predominantly positive for European sites, and that actions and lower level plans and projects arising from this will be subject to screening and/or Appropriate Assessment. It was concluded that the plan will not adversely affect the integrity of any European site with the implementation of measures presented within the NIS, and therefore there are no anticipated cumulative effects with the proposed works in this assessment.

8.2.3 Moy Arterial Maintenance Drainage Scheme 2016-2020 and 2021-2026

The channel on which the bridge will be replaced is part of the Arterial Drainage Scheme for the Moy Catchment. A 5-year NIS was completed in 2016 which assesses all impacts from the maintenance works on the European Network, and mitigation is proposed where impacts are anticipated (JBA Consulting, 2016). An updated NIS for the coming 5 years is currently going through approval (JBA Consulting, 2021).

While the 2016-2020 NIS did not identify specific maintenance works by OPW on Channel C1/46, the 2021-2026 NIS lists maintenance scheduled for the next five years includes instream silt and vegetation management and bush cutting/branch trimming. The maintenance works will follow EP 7 Environmental Drainage Maintenance, EP 9 Tree and Vegetation Maintenance, and Drainage Maintenance Silt Management. With the EPs in place, no residual impacts are anticipated. Therefore, no in-combination impacts are anticipated with the proposed works in this assessment.

8.3 Projects

In order to assess whether the other projects in the vicinity of the scheme and associated works have the potential to cause in-combination effects they must be assessed against the residual effects identified on the Natural 2000 site (as listed above in Section 8.1).

No planning applications were found that are likely to result in in-combination with the residual impact as set out above.

8.3.1 EIA Projects

The EIA Portal for Ireland shows no EIA planning applications in the scheme catchment, which are relevant to this in-combination assessment.

9 Conclusion

9.1 Potential Impacts

The proposed works on the box culvert bridge UB1 Channel C1/46 Chainage 200, on the Moy Arterial Drainage Scheme, with additional avoidance and reduction measures proposed above, will have no effect on the site integrity of any European site or the integrity of the European Network.

9.2 Cumulative Impacts

The in-combination assessment identified no plans or projects that would have a potential in-combination impact.

9.3 Summary

Following a comprehensive evaluation of the potential direct, indirect and cumulative impacts on the qualifying interests and conservation objectives for the European network, it has been concluded that the project as proposed, following the implementation of the mitigation measures, will not have an adverse impact on the integrity of the relevant European Sites, in light of their conservation objectives and best scientific evidence.

Appendices

A Method Statement for Construction of Bridge

Scheme:	Moy Arterial Drainage Scheme
Project:	Accommodation Bridge (Box Culvert) Construction @ UB1, C1/46 – 200 Chainage
Site Location:	Cloonainra, Co. Mayo: GPS Coordinates (53.994, -8.896)

1 OUTLINE OF PROPOSED WORKS

This Method Statement refers to proposed works on OPW Moy Arterial Drainage Scheme. The works include demolition and removal of an existing box culvert bridge structure and construction of new box culvert bridge, designed in accordance with the OPW Standard Design. (Drawings 2480-DR-001-P3 & 2480-DR-002-P2)

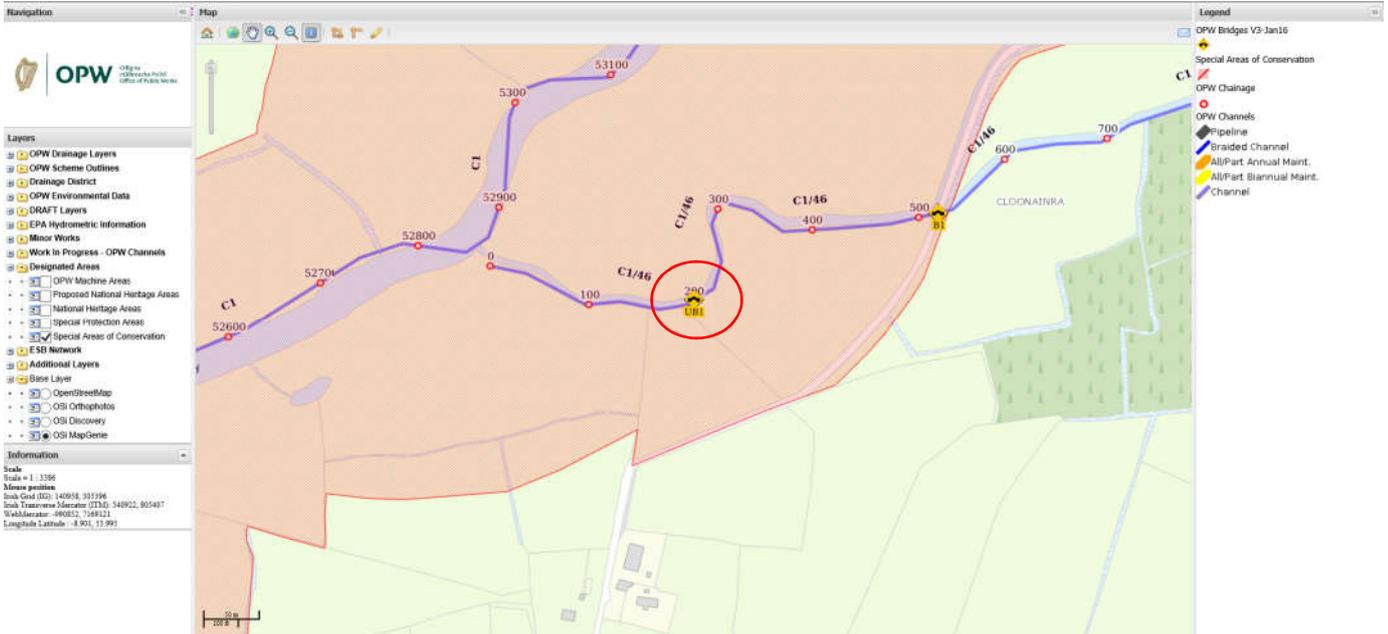
The site is accessed via local public road and then through agricultural land. Works on site will typically be carried out during standard OPW hours re: 08:00 – 16:30. Channel C1/46 – UB1 @ Chainage 200 has a base width over 3m and is therefore classified as a major channel for arterial drainage purposes. The flow and water levels in the channel will vary depending on recent rainfall patterns and time of year. It is intended to carry out works between Mid-March and 01 September 2021

Please Note: This method statement should be read in parallel with the completed OPW Project Risk Assessment Form and all relevant project drawings, specifications, schedule of commitments, construction & environmental management plan etc. TBT Covid-19 Site Safety Induction Shall also be carried out before work commences.

If any issue within this method statement, or during the progression of the works requires needs clarification, the appropriate supervisor should be contacted immediately.

Site Location - GIS DEMO - SAC Proximity

C1/46 – UB1 (Chainage 200), Cloonainra, Co. Mayo GPS Coordinates (53.994, -8.896)



Scheme:	Moy Arterial Drainage Scheme
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Channel C1/46 - UB1 at chainage 200



OPW GIS Demo– Site Layout



Site Compound – Blue (Grazed Agricultural Land)

METHOD STATEMENT



Scheme:	Moy Arterial Drainage Scheme
Project:	Accommodation Bridge (Box Culvert) Construction @ UB1, C1/46 – 200 Chainage
Site Location:	Cloonainra, Co. Mayo: GPS Coordinates (53.994, -8.896)

1 RESPONSIBILITY FOR CONTROL ON SITE		
Project Foreman:	Jarlath McHugh	Phone: 087 2514167
Site Supervisor:	Joseph Doherty	Phone: 087 6169216
Safety Representative:	Paul McGarry	Phone: 087 7986518
Safety Officer:	Keith McNulty	Phone: 093 36355
Site Engineer:	Shane Flaherty	Phone: 086 3835633

2 EQUIPMENT REQUIRED				
Major Plant	Quantity	Description	OPW	Hired
	1	14T Hydraulic Excavator	✓	
	1	Artic Truck & Low-loader	✓	
	1	Tractor & Trailer	✓	
	1	Site/Track Dumper	✓	
	1	8T Mini-Digger	✓	
Small Plant/Tools	Quantity	Description	OPW	Hired
	1	Concrete Poker Vibrator	✓	
	1	3 or 4" Water Pump	✓	
	1	Hilti Drill	✓	
Other Essential Equipment	Life Rings/Buoys Lifting Chains / Slings			

3 MATERIALS REQUIRED		
Quantity	Description	Notes
T.B.C	Formwork (Peri Formwork), Multi Props, Timber Trusses	TBC
T.B.C	Ready-Mix Concrete	As per Design Drawing
T.B.C	Steel	TBC

4 HEALTH & SAFETY
<p>All site operatives must read, and sign, the specific OPW Project Risk Assessment & Safety Plan relating to this project. The Foreman will advise of any other relevant Health & Safety issues or procedures which must be followed during the construction works.</p> <p>All works carried out on this project and site are to be carried out in accordance with the relevant OPW Risk Assessments and Safety Procedures. A copy of these documents will be available in the Site Office. All operatives are to ensure they are familiar with all of these procedures prior to commencing works.</p>

Scheme:	Moy Arterial Drainage Scheme
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Mechanical plant used on site during these works is restricted to plant approved in advance by OPW Mechanical Engineering staff and may vary depending on requirements.

Should any member of staff observe a Health and Safety issue during the course of this construction project, they must immediately inform their supervisor of their concern.

5.1 Establishment of Health & Safety Controls

The site will be prepared initially to ensure the security and safety of the site. This will include preparation of the access route, installation of fencing, gates, safety barriers & environmental barriers as required.

Designated areas within the Site Compound will be established for welfare facilities, materials storage, vehicle parking and plant storage. See Maps pages 1 & 2.

All health and safety controls identified in the OPW Project Risk Assessment & Safety Plan shall be established **BEFORE** any construction works commence. This will include signage, fencing, access/egress route, secure access ladders, barriers etc.

All operatives, and visitors to site, are required to wear appropriate PPE at all times. All OPW employees must comply with existing Covid-19 regulations and requirements.

Visitors to site shall inform the Site Foreman/Supervisor of their presence. Operatives working on the site shall escort any visitors to the Site Foreman/Supervisor immediately upon observing a visitor to the site. The Foreman will deliver a site induction to any visitors upon their arrival to site.

Good housekeeping procedures on the site shall be followed at all times. Materials will be stored tidily in a designated area, as instructed by the Site Foreman.

All potential hazards should be identified and where possible removed or appropriate mitigation measures put in place. All work to be carried out in accordance with appropriate safe working practices.

4.2 Safety Procedures & Risk Assessments

The following Safety Procedures and Risk Assessments, not exclusively, shall be examined and adhered to in the planning and execution of the works.

Risk Assessments

RA2 Bridge Construction	RA10 Handling Chemicals / Hazardous Substances
RA19 Portable Power Tools	RA18 Pipe Laying
RA5 Dam Diversion Construction RA22 Steel Fixing	RA32 Concrete Operations
RA35 Lifting Operations	RA 57 Coronavirus (Covid 19)
RA38 Ladder	RA14 Mobile Plant
RA28 Working at Heights	RA22 Steel Fixing
RA26 Vibration	RA15 Noise
RA29 Working Adjacent to or in Water	
RA6 Excavation	
RA7 Excavator 360°	
RA8 Formwork/Shuttering	

Scheme:	Moy Arterial Drainage Scheme
Project:	Accommodation Bridge (Box Culvert) Construction @ UB1, C1/46 – 200 Chainage
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Safety Procedures

- SP09 Personal Protective Equipment (PPE)
- SP17 Portable Power Tools / Abrasive Wheels
- SP32 Working Adjacent to Water

COVID-19 Compliance Warden TBT

COVID-19 Onsite Warden Checklist.

4.3 Working Adjacent to Water

The OPW “Working in or Adjacent to Water” Risk Assessment and SP32 “Working Adjacent to Water” Safety Procedure must be followed by all operatives. Guard rails shall be erected to secure banks above water.

Life-rings shall be erected at intervals not exceeding 50m along the proposed works areas.

Weather forecasts shall be consulted to ensure no potential large rainfall events are due to occur.

4.4 Working alongside Utilities

An examination of the GIS-Demo ESB layer network indicates that there does not appear to be overhead or underground assets in the vicinity of the works area.

A safe system of work shall be adopted at all times in relation to works taking place in the vicinity of overhead and underground power lines should they be observed to be present at this site location.

ESB Networks Code of Practice Avoiding Danger from Overhead Lines and HSA Code of Practice Avoiding Danger from Underground Services documents relating to these hazards shall be consulted prior to works being carried out. Copies of these documents are available in the Site Office. Any controls and mitigation measures identified in these documents shall be put in place and adhered to by all operatives.

A ground survey (CAT & Genny) by a competent operative will be carried out before any excavation takes place.

4.5 Lifting Operations

Any lifting operations required during this project must be conducted with due regard to the OPW Risk Assessment procedure.

The weights of all objects to be lifted shall be ascertained prior to lifting and all lifting appliances shall be recorded with their assigned Safe Working Load.

Lifting operations shall be undertaken in the presence of a trained slinger/signaller, with the driver of the lifting appliance having also completed slinger/signaller training.

All operatives who will be working in the vicinity of lifting operations will be informed of the lifting plan prior to any works commencing.

Ground conditions shall be assessed prior to lifting operations to ensure the lifting appliance has a suitable bearing. If there is a doubt over the ground conditions, timber matting shall be used underneath the lifting appliance.

4.6 Personal Protective Equipment

In addition to the standard PPE, operatives shall be provided with the following equipment for this project:

- Safety Goggles
- Ear Defenders
- Gloves
- Life Jacket (if water deep or fast moving – to be assessed by Alan Bane)

Scheme:	Moy Arterial Drainage Scheme
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Site Location:	Cloonainra, Co. Mayo: GPS Coordinates (53.994, -8.896)

5 ENVIRONMENTAL PROTECTION & MITIGATION	
<p>All works carried out during this project will be undertaken in accordance with OPW’s Environmental Management Protocols & Standard Operating Procedures. (Refer to “OPW Environmental Guidance: Drainage Maintenance & Construction 2019”). Environmental Drainage Maintenance (EDM) Guidelines will be followed at all times. It should be noted these works are not being carried out within an Environmentally sensitive area re: SAC, SPA or NHA.</p>	
<p>5.1 Specific Environmental Management Procedures & Controls</p>	<p>Fuelling of machines will be carried out in accordance with OPW Protocols, machines will be kept away from the channel, not less than 50m and fuelled at a safe location with all machines provided with spill kits. The jeep delivering fuel is certified in accordance with regulations and double bunded. No fuels to be stored on site only in approved vented fuel store with spill trays incorporated.</p> <p>Any other measures which are deemed necessary by the OPW Environmental Section will be carried out in a timely manner as is reasonably practicable.</p>
<p>5.2 Invasive Species</p>	<p>During the site inspection the presence of knotweed, giant hogweed etc was not observed. The site works area will be rechecked for invasive species before any works commence.</p> <p>In the event that any invasive species are encountered on site during the project, the OPW Environment Section, Invasive Species Ireland or the National Biodiversity Data Centre will be contacted immediately to advise on the procedures to be followed.</p> <p>The OPW SOP (Refer to EP 18D Invasive Plants Treatment) for the management of invasive species will be adhered to and all procedures carried out will be recorded in the Safety File.</p>
<p>5.3 Biosecurity</p>	<p>N/A</p> <p>All staff to refer to OPW Environmental Guidance: Drainage Maintenance and construction 2019 re: EP’S 18A and 18B. Particular Care shall be taken to protect against the current Crayfish Plague (EP 18B) using appropriate disinfection measures where a known waterborne risk has been identified.</p>

6 METHOD OF WORKS	
<p>6.1 Site Management</p>	<p>Prior to works beginning, a site compound shall be established with designated areas for:</p> <ul style="list-style-type: none"> ▪ Welfare Facilities ▪ Vehicle Parking ▪ Plant Storage ▪ Equipment Storage ▪ Materials Storage <p>The site compound shall be secured using ‘Heras’ style temporary fence panels. A lockable gate shall also be installed. The site compound (See page 2 Site Layout) will be set back not less than 50m from the working channel.</p>
<p>6.2 Site Preparation</p>	<p>The works area shall be fenced off to provide safety and security.</p> <p>Livestock fencing shall be installed given the location of the works within agricultural land.</p> <p>No works shall begin before the site works area is fully fenced off and secure.</p>

Scheme:	Moy Arterial Drainage Scheme
Project:	Accommodation Bridge (Box Culvert) Construction @ UB1, C1/46 – 200 Chainage
Site Location:	Cloonainra, Co. Mayo: GPS Coordinates (53.994, -8.896)

6.3 Works Plan

The Foreman, Site Supervisor and excavator operators shall walk the site in advance of any works proceeding to assess ground conditions, determine suitability of the area for the placement of machinery, location of any services, such as overhead/underground power-lines or if there is a requirement for the use of bog mats. There was also no evidence of underground services or overhead power lines observed in the vicinity of the works area. Also Refer to maps attached to PRA/M.S.

Typical duration of Box culvert bridge works will be in the region of 4 / 5 weeks (16 – 20 man weeks). This will depend on site location, existing ground conditions and accessibility. The duration of stream diversion works will vary from site to site and on the nature of channel flow and ground conditions. This aspect of the work will be minimised as best as possible. A general estimation for the duration of diversion works would be in the region of 50% of the duration of the total works. The duration of works at this site are estimated to last for approx. 16 – 20 man weeks.

On salmonid channels instream works only permitted during July-September. Our most recent records indicate that this is a salmonid channel. C1/46 is a minor channel and from observing GIS Demo Map viewer which outfalls into the River Moy C1. Consult with IFI, bridge replacement programmed between July – September.

On all occasions, the excavator operator must be satisfied with the ground conditions upon which he intends to work from.

When the excavator operator decides to position the excavator adjacent to the riverbank, he must ensure the riverbank is stable, wide enough and has sufficient bearing capacity to accommodate the machine.

Discussion must take place between the excavator operator and the operatives working in the vicinity of the plant Operatives must not enter the danger zone of the excavator unnecessarily. Excavator operator is to liaise with the appointed slinger/signaller at all times.

6.4 De-watering of Works Area/Excavations

The method of de-watering the works area will be decided upon after mobilisation to site. Consideration will be given to ground conditions and flow rates. The options will be damming and diversion channel or damming and over-pumping. A diversion route has been identified on the right bank.

If a channel diversion is to take place this will be carried out on the right bank as one looks downstream. See OPW GIS Demo extract – Site Layout on Page 2. A diversion channel can be excavated from a point upstream of the existing bridge and will tie back into the channel at a point downstream of the bridge.

Damming will be carried out immediately downstream of the channel diversion location and at a point just upstream of where the diversion channel reconnects with the working channel to ensure a dry working zone.

Dewatering of works area/ Excavations will be carried out in accordance with EP 15 Construction Silt Management. Silt management will be carried out in such a way as to eliminate/minimise the silt load downstream of the works.

The dam will be constructed using locally sourced clay material, compacted in 225mm layers. The dam will be constructed to allow a sufficient freeboard above the water level.

The Most likely option in this case to minimise silt transfer from the channel diversion will be to dam the downstream reconnection point first. This will help to trap the sediment which would otherwise be redeposited into the main channel. This point will be positioned just before the diversion channel reconnects with the main channel.

Measures for over pumping will generally be water pumped from the excavation area sump which can be released onto grassland at an appropriate distance from the channel to allow natural filtration to occur through the in-situ grasses/soils. This would be the appropriate measure for low flow conditions. Pump hoses shall be placed at a location that does not pose a tripping hazard to personnel and away from the plant operations.

For damming and over-pumping it will be constructed using a locally sourced clay material, compacted in 225mm layers along with sandbags. The dam will be constructed to allow a sufficient freeboard above the water level.

Damming will be carried out at a point upstream and downstream of the proposed bridge works to ensure a dry working zone.

Scheme:	Moy Arterial Drainage Scheme
Project:	Accommodation Bridge (Box Culvert) Construction @ UB1, C1/46 – 200 Chainage
Site Location:	Cloonainra, Co. Mayo: GPS Coordinates (53.994, -8.896)

It should be noted damming will be required for both scenarios. It is not possible to clarify at this time whether damming /over-pumping or a damming/channel diversion will be required. This will be dependent on the existing channel flow conditions at the time of mobilisation to the site. Over pumping will be carried out if there is minimal flow conditions in the channel.

6.5 Demolition of Existing Structure

Demolition works will be carried out in the dry working zone after placement of cofferdams on the upstream section of channel and installation of diversion channel or over pumping.

The existing structure will be removed using a hydraulic excavator, operated by an experienced and trained operative. Material will be removed from the area and can used as backfill if appropriate. If the material is to be stored on-site prior to removal, it must be stored in an area away from the channel and works area not less than 30 metres.

The area around the existing bridge will be excavated to a suitable width and depth as per the requirements of the new bridge design. The invert level of the existing downstream pipe culvert shall be recorded.

6.6 Construction of New Box Culvert Bridge

The new box culvert bridge will be constructed in accordance with the following OPW standard design drawings:

- **2480-DR-001-P3**
- **2480-DR-002-P3**

See appendices for copy of drawing.

The channel bed shall be excavated to an appropriate level to allow formation of an adequate base for the foundation of the bridge. Typical foundation for mass concrete box culvert is 500mm as per drawings. The ground conditions will be examined and a decision will be made by the Site Foreman and Engineer as to material needed for concrete foundations. Dowel bars are placed in the foundation to catch the abutment walls. The abutment walls are shuttered using peri handset and constructed in lifts of 1200mm to the required heights. The deck is shuttered using decking ply formwork, supported using peri multi props and timber trusses. The deck is covered using polythene sheeting to prevent any spillages of concrete. When decking formwork and working platform is in place, the deck steel is tied into position and starter bars for the parapet walls are installed. When the deck has set, the steel for parapet wall will be installed. Erect shuttering before pouring. Strike shuttering when concrete has sufficiently cured. The required deck thickness as per specification is poured. The deck will cure for 28 days before striking formwork.

Erect formwork for wing-walls (as per manufacturer/supplier instructions). Wing-walls are to be constructed as per OPW standard design drawings. Ready-mix concrete (as per specification outlined on design drawings) shall be placed in the wing-walls and vibrated using a poker vibrator. Formwork can be removed following adequate curing of the concrete (as per Engineer/Foreman instruction).

Place granular material (3" broken stone & Cl.804) above the lean-mix concrete to the finished level of the bridge crossing.

Erect formwork for parapet walls (as per manufacturer/supplier instructions). Walls are to be 225mm thick and a minimum height of 1200mm above the bridge deck. Dowels to be fixed for parapets. Ready-mix concrete (as per specification outlined on design drawings) shall be placed in the parapets and vibrated using a poker vibrator. Formwork can be removed following adequate curing of the concrete (as per Engineer/Foreman instruction).

Remove cofferdam or re-instate diversion channel, depending on method used.

METHOD STATEMENT



Scheme:	Moy Arterial Drainage Scheme
Project:	Accommodation Bridge (Box Culvert) Construction @ UB1, C1/46 – 200 Chainage
Site Location:	Cloonainra, Co. Mayo: GPS Coordinates (53.994, -8.896)

7 COMPLETION OF WORKS

Following the completion of the construction works, the surrounding area shall be reinstated to a condition similar to, or better than the pre-works situation.

Boundaries shall be re-established to the landowner's satisfaction.

A photographic survey of the completed works shall be carried out by the Site Foreman.

Records of any utility diversions and their locations shall be maintained and filed appropriately.

A final inspection of the completed works shall be carried out by the Site Foreman and OPW Engineer to ensure satisfaction with the quality of the works and allow sign-off on OPW Project Risk Assessment / Safety Plan.

Landowner to be asked to fill out Landowner Satisfaction Form while adhering to Covid-19 Protocol.

8 SCHEDULE OF APPENDICES / DOCUMENTS ATTACHED

Main Documentation:

- Site Location Maps
- Design Risk Assessment
- Project Risk Assessment
- OPW Standard Design Drawings:
- 2480-DR-003-P2
- 2480-DR-006-P1

Statutory Forms:

- TBT Covid-19 Site Safety Induction
- AF3
- AF4
- GA2
- GA3

OPW Forms:

- Incident Report Form
- Contractors Rules

Project/Site	Cloonainra, Co. Mayo, : C1/46 – UB1 @200 Chainage	
Checked By		<i>Foreman</i>
Approved By	Shane Flaherty / Darragh Darcy	<i>Engineer(s)</i>
Read & Communicated By		<i>Supervisor</i>

B Appropriate Assessment Screening

The tables below present a summary of the application of the details steps of the Ryan Hanley (2014a) screening method showing how each feature of each relevant site has been considered in the screening. The results of this screening are summarised in the screening results (Section 5).

B.1 Surface Water Pathways

Step 2 - Are any European sites located within the same surface water catchment as the Scheme or downstream within estuarine or coastal environments? Is there any surface water connectivity between the European sites and the Scheme?	Step 3 - Do these European sites support surface water dependant Qualifying Interests/Special Conservation Interests?	Step 3b Rule out impact on surface-water dependant based on known distribution of QI not occurring downstream of works	Step 5 -Are the surface water dependant Qualifying Interests/Special Conservation Interests within the zone of influence of the Scheme with respect to surface water pathways?	Step 5b- Mobile aquatic species up or downstream?	Step 7 - Based on habitat typology and location of maintenance activities are the remaining Qualifying Interests likely to be significantly effected by the Scheme?	Step 8 - Where available review Site Specific Conservation Objectives Supporting Document to confirm location of receptor relative to the proposed maintenance activities. Are significant effects still likely based on location OR the location cannot be confirmed	Step 9 - Where available review Site Specific Conservation Objectives Supporting Document to acquire details of Attributes and Targets. Are significant effects on receptors likely?
River Moy SAC (002298) (bridge in SAC boundary)	Yes White-clawed Crayfish [1092] Sea Lamprey [1095] Brook Lamprey [1096] Salmon [1106] Otter [1355] Alluvial forests [91E0] Alkaline fens [7230]	Screened out based on NPWS mapping: Alluvial forests [91E0] Alkaline fens [7230]	Yes White-clawed Crayfish [1092] Sea Lamprey [1095] Brook Lamprey [1096] Salmon [1106] Otter [1355]	Yes White-clawed Crayfish [1092] Sea Lamprey [1095] Brook Lamprey [1096] Salmon [1106] Otter [1355]	Screened in: White-clawed Crayfish [1092] Sea Lamprey [1095] Brook Lamprey [1096] Salmon [1106] Otter [1355] Screened out due to >5km/3km (Ryan Hanley typology) distance: Alluvial forests [91E0] Alkaline fens [7230]	N/A	Screened in Surface-Water dependant QIs due to Precautionary principle: White-clawed Crayfish [1092] Sea Lamprey [1095] Brook Lamprey [1096] Salmon [1106] Otter [1355]

B.2 Land and Air Pathways

Step 2: Are any European sites overlapping or located within 600m of the Scheme?	Step 3: Do these European sites support Qualifying Interests/Special Conservation Interests which could be impacted by Land & Air pathways?	Step 5: Are the Qualifying Interests/Special Conservation Interests within the zone of influence of the Scheme with respect to Land & Air pathways?	Step 8: Where available review Site Specific Conservation Objectives Supporting Document to confirm location of receptor relative to the proposed maintenance activities. Are significant effects still likely based on location OR the location cannot be confirmed?	Step 9: Where available review Site Specific Conservation Objectives Supporting Document to acquire details of Attributes and Targets. Are significant effects on receptors likely?
River Moy SAC (002298) (bridge in SAC boundary)	Lutra lutra (Otter) [1355], Salmo salar (Salmon) [1106], Petromyzon marinus (Sea Lamprey) [1095], Lampetra planeri (Brook Lamprey), Austropotamobius pallipes (White-clawed Crayfish) [1092], Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0], Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510], 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]	Based off NPWS mapping The following QIs are not located in ZOI: Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0], Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510], 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] QIs in ZOI: White-clawed Crayfish [1092] Sea Lamprey [1095] Brook Lamprey [1096] Salmon [1106] Otter [1355]	Yes- using precautionary principle: Austropotamobius pallipes (White-clawed Crayfish) [1092] Petromyzon marinus (Sea Lamprey) [1095] Lampetra planeri (Brook Lamprey) [1096] Salmo salar (Salmon) [1106], Lutra lutra (Otter) [1355]	QIs screened in which may be impacted from vibration and barriers to migration/distribution: Austropotamobius pallipes (White-clawed Crayfish) [1092] Petromyzon marinus (Sea Lamprey) [1095] Lampetra planeri (Brook Lamprey) [1096] Salmo salar (Salmon) [1106] . QIs screened in which may be impacted by noise and visual disturbance: Lutra lutra (Otter) [1355]

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