Appropriate Assessment Screening of the Maintenance of Dunmanway Flood Relief Scheme 2023

Final Report

November 2022

www.jbaconsulting.ie

Office of Public Works
Jonathan Swift Street
Trim
Co. Meath

JBA Project Manager

Tom Sampson, JBA Consulting, 24 Grove Island, Corbally, Limerick, Ireland

Revision history

Revision Ref/Date	Amendments	Issued to
S3 P01 September 2022	Draft report	OPW
S3 P02 November 2022	Final report – minor amendments	OPW
A1 C01 November 2022	Final report for consultation	OPW

Contract

This report describes work commissioned by the Office of Public Works under contract 188877 Work Package 2- 2021 Environmental Consultancy services. Steven Heathcote and Rob Dalziel of JBA Consulting carried out this work.

Prepared by ..... Rob Dalziel BSc (Hons) MSc ACIEEM

Senior Ecologist

Reviewed by ..... Steven Heathcote BA(Hons) DPhil CEcol MCIEEM

Chartered Senior Ecologist

Purpose

This document has been prepared as a Final Report for the Office of Public Works. JBA Consulting accepts no responsibility or liability for any use that is made of this document other than by the Client for the purposes for which it was originally commissioned and prepared. JBA Consulting has no liability regarding the use of this report except to the Office of Public Works.

Copyright

© JBA Consulting Engineers and Scientists Limited 2022.

Executive summary

JBA Consulting has been commissioned by the Office of Public Works (OPW) to carry out Appropriate Assessment screening for the Maintenance of the Dunmanway Flood Relief Scheme. The assessment is an update of screening completed for the Scheme in 2014.

This screening report assesses the likely significant effects on Natura 2000 sites within the zone of influence of the proposed drainage maintenance activities in the Dunmanway Flood Relief Scheme. Three source > pathway > receptor chains have been examined to assess the likely impact of drainage maintenance activities on Natura 2000 sites; surface water, land and air, and groundwater pathways.

From this screening exercise it has been determined that Likely Significant Effects may arise on the following Natura 2000 sites as a result of Scheme activities:

- Bandon River SAC 002171

No other sites site fell within the project Zone of Influence.

An Appropriate Assessment is required to determine if these Likely Significant Effects could have an adverse effect on the integrity of the Bandon River SAC and if so whether sufficient avoidance and reduction measures can be applied to the works to avoid any adverse effects.

Contents

1	Introduction	5
1.1	Background	5
1.2	Legislative Context	5
1.3	Appropriate Assessment Process	6
1.3.1	Stage 1 - Screening for AA	6
1.3.2	Stage 2 - AA	6
1.3.3	Stages 3 & 4 – Alternative solutions and IROPI	6
1.4	Structure of this Report	7
2	Methodology	8
2.1	Desktop Study	8
2.2	Screening Method	9
2.2.1	Source of Impacts	10
2.2.2	Pathways	12
2.2.3	Receptors	13
2.2.4	Zone of Influence	13
2.3	The Likely Significant Effects Test	14
2.4	In-combination Screening	14
2.5	Presentation of the results of the Screening Assessment	14
3	Scheme Description	15
3.1	The Dunmanway Scheme and Proposed Works	15
4	Screening for Land and Air Pathways	18
5	Screening for Surface Water Pathways	20
5.1	Scheme Impacts and Surface Water Connection	20
5.1.1	Summary	20
6	Screening for Groundwater Pathways	22
7	Screening Summary	23

List of Figures

Figure 1-1: The Appropriate Assessment Process (from: Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities, DoEHLG, 2010) 6
Figure 2-1. Irish grid squares containing scheme channels 10
Figure 3-1: Location of Scheme channels showing frequency of maintenance. 16
Figure 3-2: Location of scheme channels and structures (bridges) 17
Figure 5-1. Screening for sites with surface water connectivity 21
Figure 7-1. Natura 2000 sites screened in 24

List of Tables

Table 2-1. Details of potential sources of impact 11
Table 3-1: OPW Drainage Maintenance Types 15
Table 4-1 Land and air pathways 18
Table 4-2 Summary results of QIs with potential land connectivity, resulting in a potential for impact from the proposed works through land and air pathways 18
Table 5-1. Surface water pathways – connectivity screening 20
Table 6-1. Natura 2000 sites with potential to be impacted by groundwater pathways 22
Table 7-1. Screening Assessment summary. 23

Abbreviations

AA	Appropriate Assessment
CIEEM	Chartered Institute of Ecology and Environmental Management
CJEU	Court of Justice of the European Union
EPA	Environmental Protection Agency
GWB	Groundwater body
GWD	Groundwater Dependent
IFI	Inland Fisheries Ireland
IROPI	Imperative Reasons of Overriding Public Interest
LSE	Likely Significant Effect
NBDC	National Biodiversity Data Centre
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife Service
OPR	Office of the Public Regulator
OPW	Office of Public Works
QI	Qualify Interest
SAC	Special Area of Conservation
SPA	Special Protection Area
SRP	Source receptor pathway
SWD	Surface water dependent
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 Environmental Consultancy services in relation to statutory arterial drainage maintenance activities on the Dunmanway Flood Relief Scheme. As part of the environmental review process, OPW prepares or commissions an Appropriate Assessment screening, and if necessary, a Natura Impact Statement (NIS) to inform a full Appropriate Assessment, to determine whether the Scheme is likely to have an adverse impact on the integrity of any Natura 2000 sites, in light of its conservation objectives and best scientific knowledge, either alone or in combination with other plans or projects.

The proposed Scheme is the Maintenance of the Dunmanway Flood Relief Scheme, furthermore, referred to as the "Scheme", and is required as part of maintenance activities under the Arterial Drainage Acts of 1945 and 1995, and includes the Scheme channels that drain into the Bandon River.

This Appropriate Assessment screening provides the results of the screening appraisal conducted for the maintenance of the Dunmanway Flood Relief Scheme to complete the first stage of the appropriate assessment process in accordance with Article 42 of the 2011 Bird and Habitats Regulations, which implements the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora) into Irish Law.

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 of inter alia the European Communities (Birds and Natural Habitats) Regulations 2011-2021 as amended.

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, in this case OPW as a public body, can only grant consent for to a plan or project after having determined that it will not adversely affect the integrity of any Natura 2000 site, in light of its conservation objectives and best scientific evidence, either alone or in combination with other plans or projects.

Under article 6(4) of the Directive, if adverse impacts are likely, and in the absence of alternative options, a plan or project must nevertheless proceed for imperative reasons of overriding public interest (IROPI), including social or economic reasons, a Member State is required to take all compensatory measures necessary to ensure the overall integrity of the Natura 2000 site network.

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) (2010). These guidance documents identify a staged approach to conducting an AA, as shown in Figure 1-1.

Figure 1-1: The Appropriate Assessment Process (from: Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities, DoEHLG, 2010)

1.3.1 Stage 1 - Screening for AA

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

whether the proposed plan or project is directly connected with, or necessary for, the management of the European designated site for nature conservation

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 suggested.

The competent authority can only agree to the plan or project after having ascertained that it will not adversely of any Natura 2000 site, in light of its conservation objectives and best scientific evidence, either alone or in combination with other plans or projects, after mitigation measures have been applied, and the mitigation measures are certain and capable of being 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 Stages 3 & 4 – Alternative solutions and IROPI

Where adverse impacts on the integrity of Natura 2000 sites are identified, after mitigation measures have been applied, or the mitigation measures are not certain / capable of being successfully implemented, alternative ways of achieving the objectives of the plan or project that avoid adverse impacts need to be considered. If

none can be found, the assessment must demonstrate Imperative Reasons of Overriding Public Interest (IROPI) and provide suitable compensation.

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 Scheme to the integrity of the Natura 2000 sites concerned, this AA screening presents the following:

- Section 2: Details of the methods used in this assessment.
- Section 3: A detailed description of the proposed scheme and its zone of influence.
- Sections 4-6: Screening of Natura 2000 sites based on those that are located within the Zone of Influence (ZOI) of the proposed works for each of the key impact pathways.
- Section 7: A summary of the screening assessment.

2 Methodology

This AA Screening has been prepared having regard to the Birds and Habitats Directives, the European Communities (Birds and Natural Habitats) Regulations 2011-2021 as amended and relevant jurisprudence of the EU and Irish courts. The following documents have also been used to provide guidance for the assessment:

- DoEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government.
- 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 (2021) Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC. European Commission.
- EC (2013) Interpretation Manual of European Union Habitats. Version EUR 28. European Commission.
- Chartered Institute of Ecology and Environmental Management (CIEEM) (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland - Terrestrial, Freshwater and Coastal, Version 2.1.
- National Parks and Wildlife Service (NPWS) (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview. Unpublished NPWS report.
- NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report.
- NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments. Unpublished NPWS report.
- OPR (2021) Appropriate Assessment Screening for Development Management. OPR Practice Note PN01.
- Ryan Hanley (2014) Stage 1: Appropriate Assessment Screening Methodology for the Maintenance of Arterial Drainage Schemes.
- Ryan Hanley (2014) Source » Pathway » Receptor Chains for Appropriate Assessment. Arterial Drainage Maintenance Categories.

2.1 Desktop Study

A desktop study was conducted in May 2022 of available published and unpublished information, along with a review of data available on the 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 data within the surrounding 2 km grid squares of the Scheme, within the past 10 years. Data was gathered from 2 No. 2 km grid squares (Figure 2-1) to encompass the entire works of the scheme.
- NPWS website (www.npws.ie), (https://www.npws.ie/), where site synopses, Natura 2000 data forms and conservation objectives were obtained along with Annex 1 habitat distribution data and status reports.

- National Biodiversity Data Centre (NBDC) Maps (http://maps.biodiversityireland.ie/#/Map)
- Environmental Protection Agency (EPA) maps website (https://gis.epa.ie/EPAMaps/)
- Water Maps (www.watermaps.wfdireland.ie)
- Review of previous surveys for Arterial Drainage activities including the screening assessments and habitat maps for the schemes completed in the previous review cycle (JBA 2018), to the extent only that the information contained therein was still up to date best scientific knowledge.
- OPW database of habitat mapping of SAC and SPA Channels, and incidental records of protected and invasive species (reviewed May 2022)

In addition, information on the geology, hydrology and WFD status were gathered from the Environment Protection Agency's Geoportal (EPA 2020).

2.2 Screening Method

A screening method was developed in 2014 to cover the unique nature of the maintenance of Arterial Drainage Schemes (Ryan Hanley 2014a), hereafter the 'Ryan Hanley method'. The approach used a source-receptor-pathway (SRP) process to identify combinations of activities, ecological features and connecting pathways that could result in Likely Significant Effects (Ryan Hanley 2014b).

The SRP approach was also identified by OPR (2021) as best-practice for assessing the impact of projects. Maintenance of Arterial Drainage Schemes present a combination of attributes different from one-off projects, in that it is a programme of actions undertaken in a cyclical manner. The actions are generally small-scale and time limited but can cover a large geographic area.

The Ryan Hanley method was re-appraised in the light of recent guidance on AA (OPR 2021) as well as accumulated knowledge of the impacts of Arterial Drainage Schemes from ongoing audits of the maintenance works across the country. Since 2014 there have also been a number of rulings of the CJEU in relation of Appropriate Assessment that have altered the way the Habitats Directive is applied in practice.

Each element of the SPR pathway was reviewed in turn as set out below. It is important to note that assessment is for the maintenance activities of the Scheme, rather than impacts when it was created.

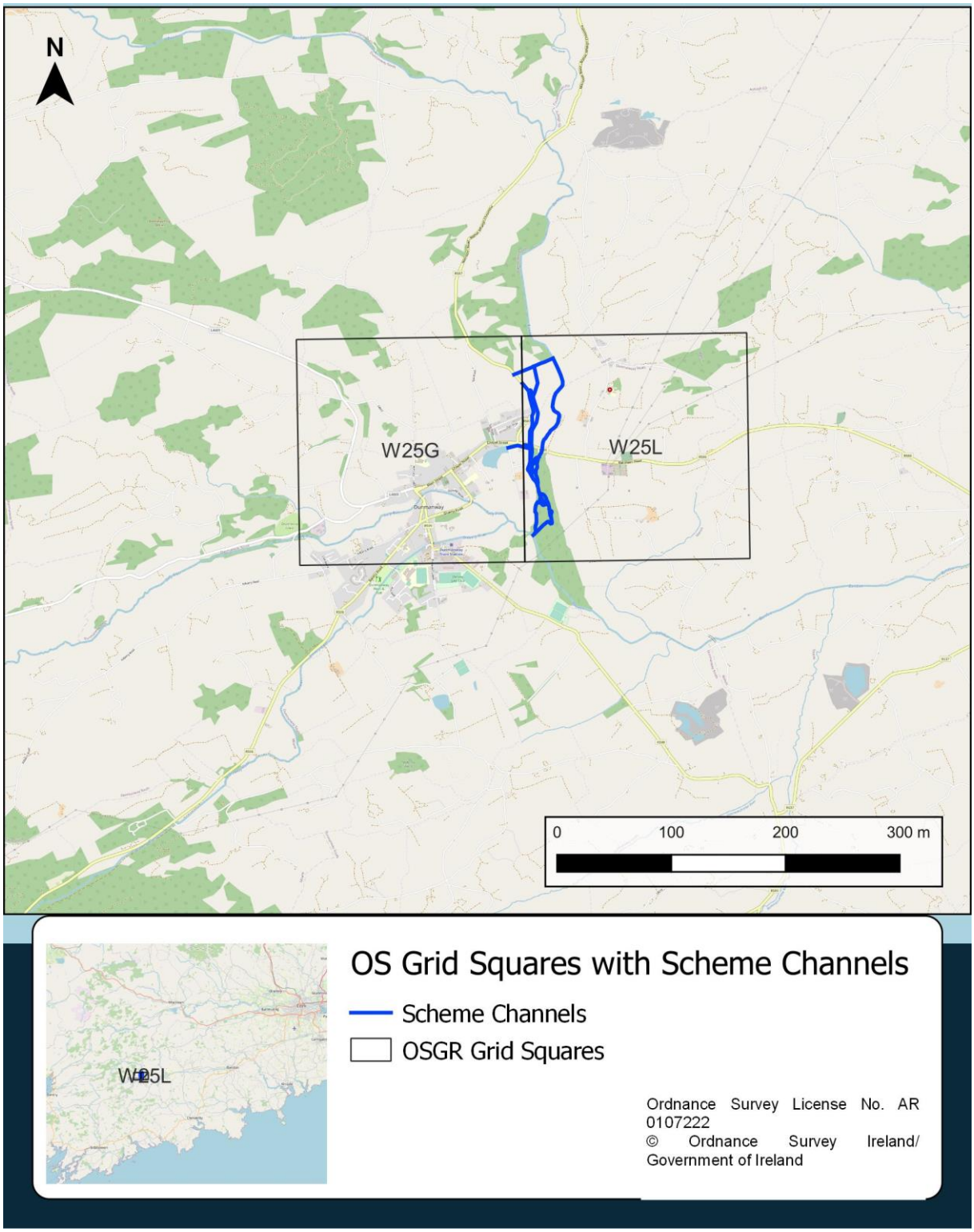

Figure 2-1. Irish grid squares containing scheme channels

2.2.1 Source of Impacts

Impacts documented in any audit notes were collated and checked (as well as discussing with the auditors) against the original list, along with other impacts found by searching the grey literature and Article 17 reports relating to specific species.

Audit notes include illustrations of the work and highlight the extent of any potential problems. The original sources of impacts were found to be comprehensive, with no new sources of impact added.

Given that the assessment is for the maintenance of the Scheme, rather than impacts when it was created, no evidence could be found of impacts of river maintenance activity via a groundwater pathway on any Natura 2000 site. In some situations, there is a very small possibility of impacts via groundwater pathways.

The sources of impacts are based on a reasonable worst-case scenario. In many cases audits of OPW works identify the use of best practice. However, in 2020 and 2021, 10% and 6% of audits achieved a poor score respectively, and the impacts of this poor performance are what is assessed here.

The sources of impact assessed are shown in Table 2-1.

Table 2-1. Details of potential sources of impact

Activity	Impact
Disturbance of species and habitats	
Vehicle movement along MAC and during operation; vehicle operations in bridge and sluice maintenance	Habitat disturbance/compaction
	Species disturbance from adjacent habitat: Noise Visual Vibration
Channel maintenance – silt and vegetation removal	Removal of Annex 1 habitat
	Removal of habitat for species, direct mortality, displacement, reduction of food availability
Bridge maintenance	Loss of bat roosts
Embankment maintenance	Loss of Otter habitat through mowing
	Loss of bird habitat through mowing
Release of suspended solids	
Silt and vegetation management; sluice maintenance	Release of solids downstream – impacting FWPM, other aquatic and riparian species
Silt and vegetation management; sluice maintenance	Release of solids downstream – stress to fish
Silt and vegetation management; sluice maintenance	Smothering of aquatic vegetation
Release of nutrients/changes in nutrient levels	
Silt and vegetation maintenance	Release from dredged material into bankside habitat
	Re-suspension of deposited nutrients
Vegetation cutting	Release from decaying cut material into embankment and channel
	Release from plant material cut and floating downstream in channel

Activity	Impact
Changes in water levels	
Silt and vegetation management	Removal of blockages lowers upstream surface water level
Silt and vegetation management	Removal of blockages changes upstream groundwater levels

The following activities were considered as a potential source of impact but, consistent with Ryan Hanley (2014b) were found not to present any potential risk:

- creation of site compounds and haul roads – these are rarely needed and if so use existing farmland. New compounds or haul roads in or adjacent to designated sites would be subject to a separate appropriate assessment
- Light pollution – working hours and safe working practice means that maintenance activities are only conducted in the daytime.
- Excavation beyond design level – this is not permitted as part of maintenance activities. Any alteration to the base level and maximum capacity of a channel would be subject to a separate appropriate assessment where it had the potential to impact on designated sites.
- Hydrocarbon and chemical spillage – there is no risk of significant chemical or hydrocarbon spillage taking place as the volumes used are tiny and the machinery is modern equipment of a high standard which uses biodiesel.
- Exhaust emissions and air quality – the amount of emissions to the air from maintenance activities is negligible due to the small size of the maintenance crews and the low number of vehicles necessary for the works. By clearing blockages there may also be impacts.
- Migration of fish – the proposed works do not result in channel obstruction and only a very short-term disturbance that might interrupt migration. Consultation with Inland Fisheries Ireland (IFI) ensures that instream works are conducted during the most appropriate season. Therefore obstruction to fish migration does not occur as a result of the Scheme.
- Disturbance of birds in supporting habitat – the small number of machines and small size of maintenance crew are little different from typical agricultural activities, and therefore there will be no additional disturbance to bird species in supporting habitat. The disturbance impact in habitat within the SAC is included as noted above, and it is only supporting habitat outside the SAC which is excluded. Where possible, vegetation removal is undertaken outside of the breeding bird season, which runs from March to August (inclusive). All nesting birds are protected from disturbance by the Wildlife Act 2000 (as amended), and so all maintenance activities undertaken as part of the Scheme must comply with this legislation.

2.2.2 Pathways

The potential pathways for impacts are assessed as follows:

1 Land – direct result of maintenance works including vehicle movement as well as storage areas and vegetation management.

2 Surface water – impacts can be carried downstream in the normal flow of water. Upstream impacts may also be transmitted where the level of the water is altered.

3 Groundwater – in very rare circumstances, the maintenance works may alter the condition of the groundwater, which can be transmitted downgradient.

2.2.3 Receptors

The receptors are any of the Natura 2000 sites in Ireland and their Qualify Interest features. A full list of the habitats and species and whether they are considered to be dependent on ground or surface water are given in the appendices of Ryan Hanley (2014b).

2.2.4 Zone of Influence

The Zone of Influence from drainage maintenance activities is generally very small. Small crews operate a single machine and hand tools, or sometimes a pontoon or weed-cutting boat. The majority of impacts will occur within the immediate vicinity of the works (<10m). However, some effects may be transmitted further afield. For noise, vibration and visual disturbance impacts on species can occur at some distance. The TIDE toolkit suggests 500m is a useful precautionary distance, particularly near estuaries (Cutts et al. 2013). There is evidence that Greenland White-fronted Geese are disturbed at 600m (Ryan Hanley 2014a) so on a precautionary basis this distance is used for screening sites for land impacts.

Some SACs are designated for mobile species that use aquatic and riparian habitat, including Otter, Salmon, Lamprey, White-clawed Crayfish as well as bird species for SPA sites. Although by definition the SAC provides the core area of their habitat, scheme channels may form part of supporting habitat. For the purpose of screening for likely significant effects, it is assumed that the most important supporting habitat for Crayfish and other invertebrates will be within 300m of the SAC (Robinson 2000), and for Otters that have much larger ranges (Chanin 2003), up to 20km, but in all cases only where surface water pathways exist for the species to move between Scheme channels and the SAC. No additional screening distance is used for fish as their core habitat will be with the SACs, and the works do not present barriers to migration.

Effects transmitted through groundwater and surface water can be carried some distance, although the dilution effect of surface water means that at longer distances impacts are reduced significantly. In-channel maintenance works are also not introducing new suspended solids to the system, but rather mobilising material that has settled out since the previous maintenance period, and streams where there are higher levels of silt to clear as part of maintenance are likely to have higher baseline levels of suspended solids in the water. Works to embankments, including riparian disturbance could mobilise additional suspended solids if not managed carefully. There is no published evidence of how quickly any suspended solids released during maintenance activities remain at levels that would impact on wildlife, but based on experience and professional opinion, effects rarely persist more than 2km downstream due to the small-scale nature of the works. However, a precautionary distance of 5km is used for screening of sites for surface water impacts. The same detail applies to nutrients released into the water, for which new nutrients are not added, and those re-mobilised will also be quickly diluted. The screening distance is extended to 35km downstream for sites designated for Freshwater Pearl Mussel due to their unique sensitivity to suspended solids (NPWS 2022).

Upstream impacts are limited to changing water levels. Observation of OPW channels during previous walkover surveys and maintenance audits have shown that build up of silt and vegetation in the channel is not strong enough to create changes in water levels of more than a few centimetres. On removal of the obstruction the impacts on upstream water level are only conveyed a limited distance as there are a range of

control levels throughout a river system, including natural areas such as bedrock reaches as well as artificial structures such as bridges. It is unlikely that any clearance will result in changes in water levels more than 1km upstream, but a precautionary distance of 3km is used for the screening assessment to identify potentially sensitive sites.

2.3 The Likely Significant Effects Test

The test for AA screening is whether the Scheme could have a 'Likely Significant Effect' (LSE) on any Natura 2000 site. A likely significant effect is defined as any effect that could undermine the conservation objectives of a Natura 2000 site, either alone or in combination with other plans or projects. There must be a causal connection between the Scheme and the qualifying interest of the site which could result in possible significant effects on the site. This is consistent with the approach to assessing LSE used in Ryan Hanley (2014a). The LSE test is a lower threshold for the screening assessment than 'adverse effect on site integrity' considered at the full Appropriate Assessment stage as screening is intended to be a preliminary examination for potential effects.

The Zone of Influence was used to identify Natura 2000 sites that could be impacted by the project. For each of these sites, the Qualifying Interest features and their associated conservation objectives were identified, and the possibility of LSE was determined by a combination of location, ecological and hydrological connectivity, sensitivity of receptor and magnitude of the source of impact.

2.4 In-combination Screening

The possibility of in-combination effects are considered only at a high level. Where sites are otherwise screened out, an assessment of whether the Scheme will have any effect at all is made. Where there is no effect at all via a pathway, there is no possibility of in-combination effects. Where an LSE is identified, the in-combination assessment is carried forwards to the Stage 2 Appropriate Assessment and presented in the Natura Impact Statement (NIS).

2.5 Presentation of the results of the Screening Assessment

The remainder of this report presents the results of carrying out the Likely Significant Effects test to identify if any sites need to be taken forwards for further assessment or whether all effects can be screened out.

3 Scheme Description

3.1 The Dunmanway Scheme and Proposed Works

The Dunmanway Flood Relief Scheme is in County Cork. It includes 5.4km of watercourse and 0.8km of embankment (Figure 3-1) and 11 bridges (Figure 3-2). They drain primarily agricultural land from the north through areas of woodland towards an outfall with the River Bandon at its confluence with the Dirty River.

Arterial Drainage Maintenance (including maintenance of Flood Relief schemes) includes a range of operations such as silt and vegetation management, mowing and structure maintenance, and listed as channel, embankment or structure maintenance in Table 3-1 below. It is required to retain the arterial drainage scheme design capacity. In other schemes it is assumed that any works could take place in any of the channels. However, due to the unique nature of Dunmanway, which is located within the River Bandon SAC, only the planned maintenance activities are assessed here. Any activities beyond the planned maintenance must be subject to separate assessment as they are outside the scope here. The only exception to is bridge maintenance works that includes vegetation management on the bridge, works, such as minor repairs and repointing to the above-water parts of the bridge that do not require entry into the water or creation of a dry area of riverbed and do not include works where potentially toxic substances are not used.

Table 3-1: OPW Drainage Maintenance Types

Category	Maintenance Type	Code	Planned Maintenance
Channel Maintenance	Silt and vegetation management	A	7 (2.5km)
	Aquatic vegetation cutting	B	-
	Bank protection	C	-
	Bush cutting/Branch trimming	D	7 (2.5km)
	Tree cutting	E	7 (2.5km)
	Other	K	6 (2.9) – removing blockages from bridges
Embankment Maintenance	Bush cutting/Branch trimming	D	-
	Tree cutting	E	-
	Mulching	F	3 (0.8km)
	Mowing	G	-
	Gate installation	H	-
Structural Maintenance	Sluice maintenance	I	-
	Bridge maintenance	J	-
	Bank protection	C	-
	Bush cutting/Branch trimming	D	-
	Tree cutting	E	-

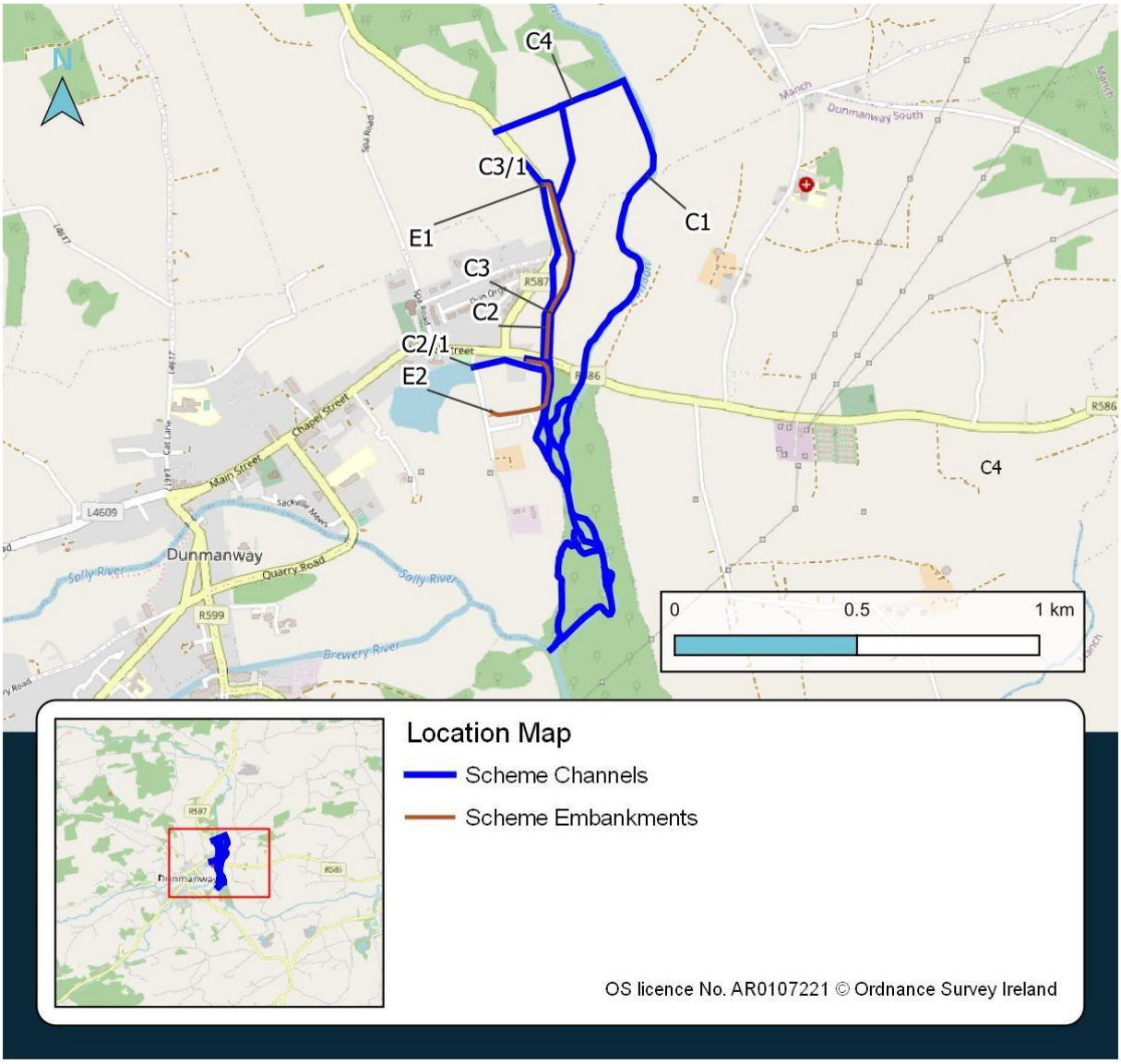

Figure 3-1: Location of Scheme channels showing frequency of maintenance.

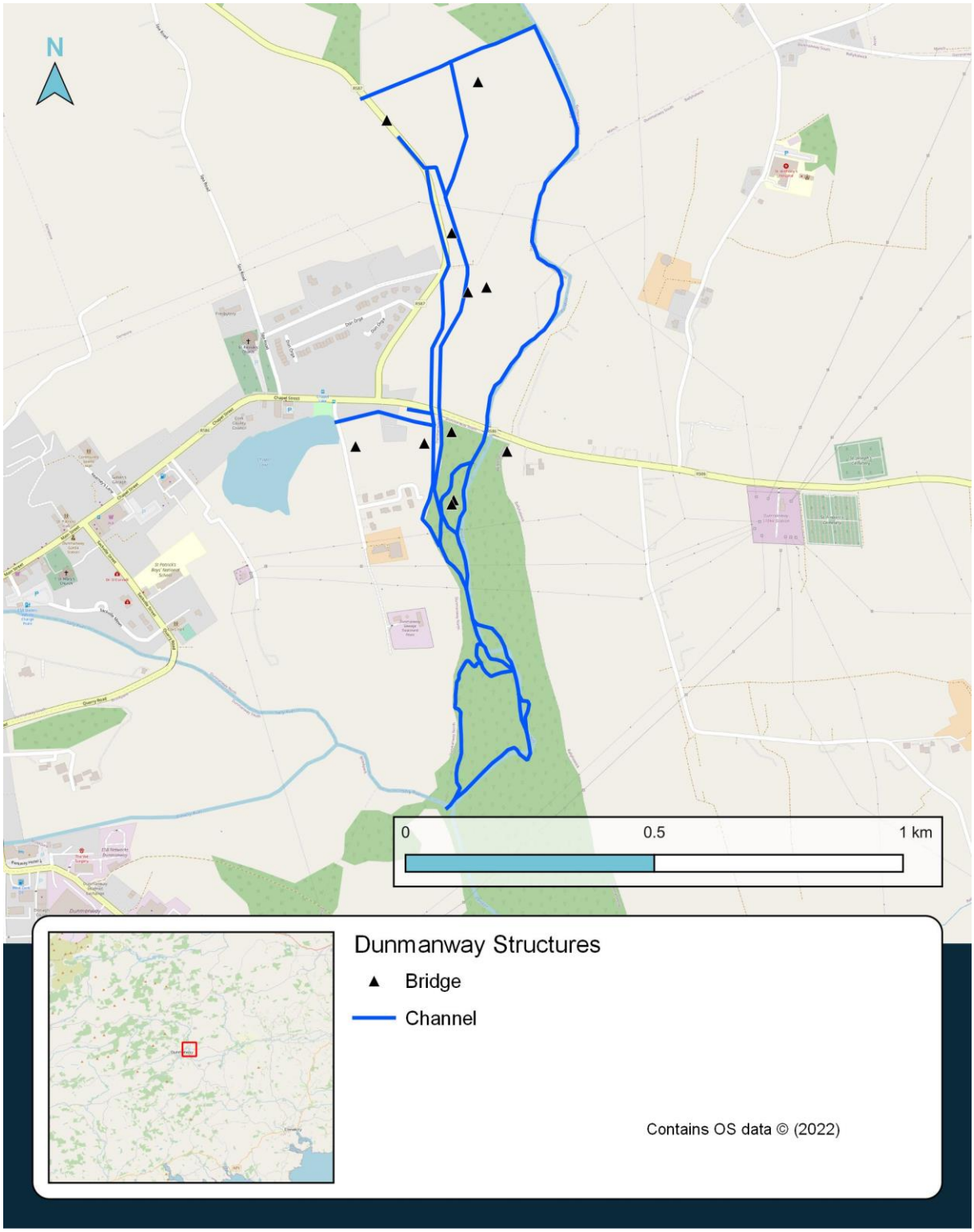

Figure 3-2: Location of scheme channels and structures (bridges)

4 Screening for Land and Air Pathways

The relevant ZoI for land and air pathways is up to 0.6km from the scheme watercourses. Only the River Bandon SAC falls within this distance, with Scheme channels inside this SAC.

Table 4-1 Land and air pathways

Natura 2000 site Name	0.6km Buffer Zone	0.01km (Overlap)
	Indirect impacts for noise and visual disturbance through air pathways	Direct impacts from physical disturbance of habitats through land pathways
River Bandon SAC	Yes	Yes

Summary results of qualifying interests (QIs) with potential for significant impact by land and air pathways are shown for each of the Natura sites in Table 4-2.

Table 4-2 Summary results of QIs with potential land connectivity, resulting in a potential for impact from the proposed works through land and air pathways

Code	Species/ Habitats	Maintenance activity location relative to Natura 2000 site	Qualifying Interest location relative to drainage maintenance activity	Location of Impact	Result
River Bandon SAC					
3260	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	Within	<100m	INST	LSE
91E0	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	Within	<100m	INST and MAC	LSE
1029	*Margaritifera margaritifera* (Freshwater Pearl Mussel)	Within	<100m	INST	LSE
1096	*Lampetra planeri* (Brook Lamprey)	Within	<100m	INST	LSE
INST = In-stream; MAC = Maintenance and Access Corrridors; LSE = likely significant effect					

In summary, QIs of the following Natura 2000 sites have been identified as potentially being at risk from Likely Significant Effects and require further assessment:

River Bandon SAC

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]

- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]
- *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]
- *Lampetra planeri* (Brook Lamprey) [1096]

5 Screening for Surface Water Pathways

5.1 Scheme Impacts and Surface Water Connection

The Scheme sits within the Bandon catchment, and within 1 WFD surface water sub-catchments. There is 1 Natura 2000 site within the WFD sub-catchment water body (Table 5-1), the River Brandon SAC. There is surface water connectivity and all of the QI features of this SAC are surface water dependent (SWD) and occur within or near to the proposed works area so have Likely significant Effects.

Table 5-1. Surface water pathways – connectivity screening

Natura 2000 site	Is site within the same surface water catchment as the scheme?	Is there surface water connectivity with the scheme?	SWD QI?
Sites with connectivity			
River Bandon SAC	Yes	Yes	Yes

5.1.1 Summary

The screening has identified that only one site is within the relevant screening distances and could potentially be impacted via surface water pathways. Consideration of flow path distances and the conservation objectives of the SWD QIs mean that only one site is identified as having a likely significant effect and require further assessment:

River Bandon SAC

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]
- *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]
- *Lampetra planeri* (Brook Lamprey) [1096]

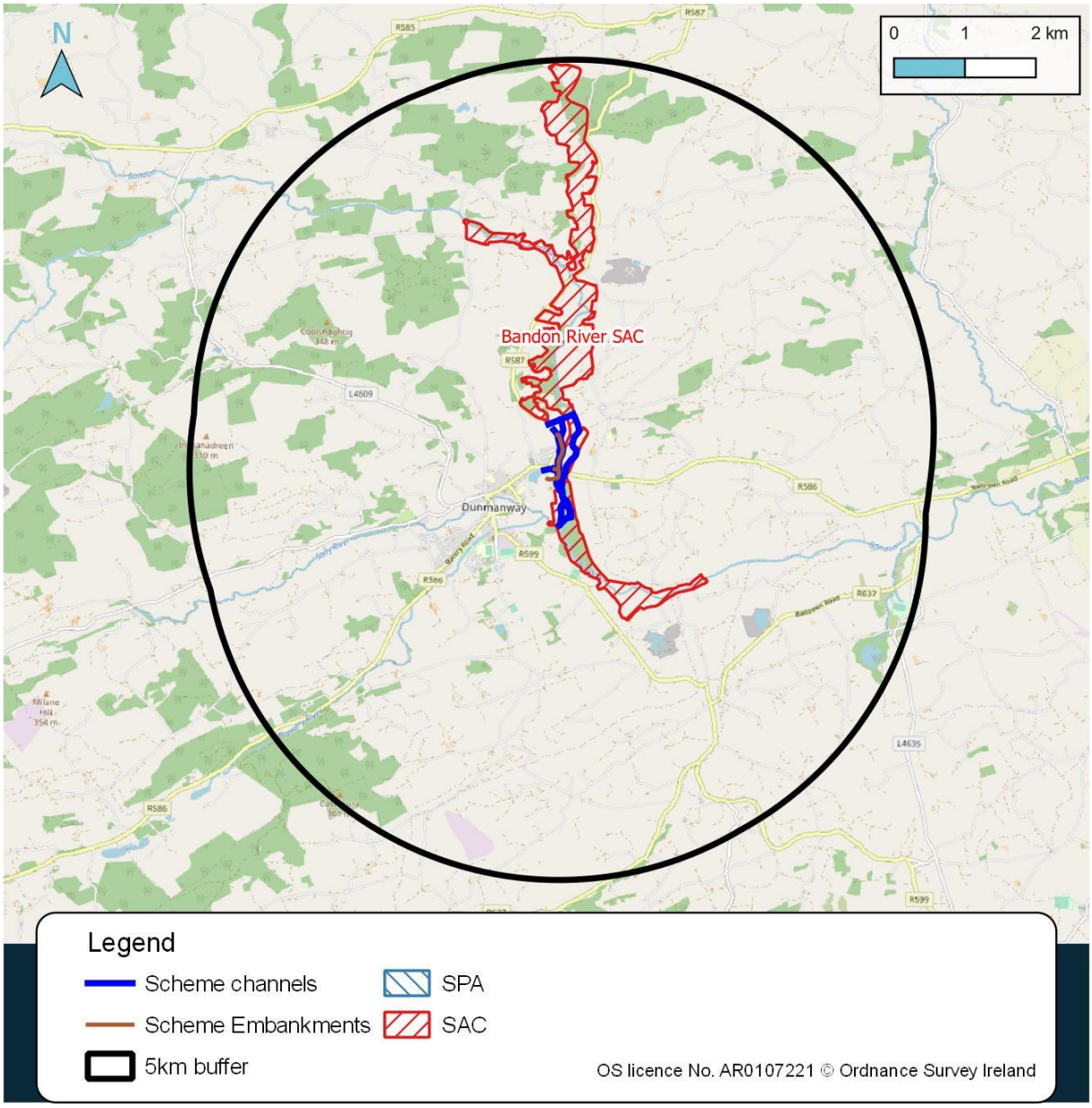

Figure 5-1. Screening for sites with surface water connectivity

6 Screening for Groundwater Pathways

This assessment was determined based on the location of the relevant Natura 2000 sites within the relevant groundwater bodies (GWBs) containing Scheme channels. Each qualifying interest of the screened in Natura 2000 site, was then assessed individually for potential to be impacted. The location of the drainage maintenance activity works relative to the Natura 2000 sites and qualifying interests were considered to determine relevance at this stage, along with GWD habitat typology. Pre-determined distances and typologies (Ryan Hanley 2014b) were used to define the zone of influence of the works and determine potential and significance of impacts.

The Dunmanway Flood Relief Scheme is located across one groundwater bodies (Table 6-1) which contains only the River Bandon SAC. The QI features of the River Bandon SAC are all riverine or riparian, and to some extent may rely on local groundwater discharge to help maintain the condition and flow characteristics of the river. All QI features of this site are therefore screened in for further assessment.

Table 6-1. Natura 2000 sites with potential to be impacted by groundwater pathways

GWB name (EU_Code) and flow regime	Natura 2000 site (Site Code) within GWB	Natura 2000 site with GWD features
Bandon IE_SW_G_086 Poorly productive bedrock	River Bandon SAC	Yes

In summary, QIs of the River Bandon SAC have been identified as potentially being at risk from Likely Significant Effects and require further assessment:

River Bandon SAC

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]
- *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]
- *Lampetra planeri* (Brook Lamprey) [1096]

7 Screening Summary

From this screening exercise it has been determined that significant likely effects may arise at one Natura 2000 site as a result of the Scheme, the River Brandon SAC. The site and the pathways to impact are shown in Table 7-1. No other Natura 2000 sites occurred within the project zone of influence.

Table 7-1. Screening Assessment summary.

Site	Surface water	Land	Ground water	Comment
River Bandon SAC (002171)	LSE	LSE	LSE	Overlapping the planned works, this SAC supports two habitats which are affected by surface water and groundwater pathways: water courses of plain to montane levels and Alluvial forests. The SAC also supports two species which are affect by surface water pathways: freshwater pearl mussels and brook lamprey. As drainage maintenance works are proposed for within site boundaries adverse impacts via land and air pathways may also arise.

This means the River Bandon is carried forwards for Appropriate Assessment. Its location is shown in Figure 7-1. An Appropriate Assessment is required to determine if these Likely Significant Effects could have an adverse effect on the integrity of the sites and if so whether sufficient avoidance and reduction measures can be applied to the works.

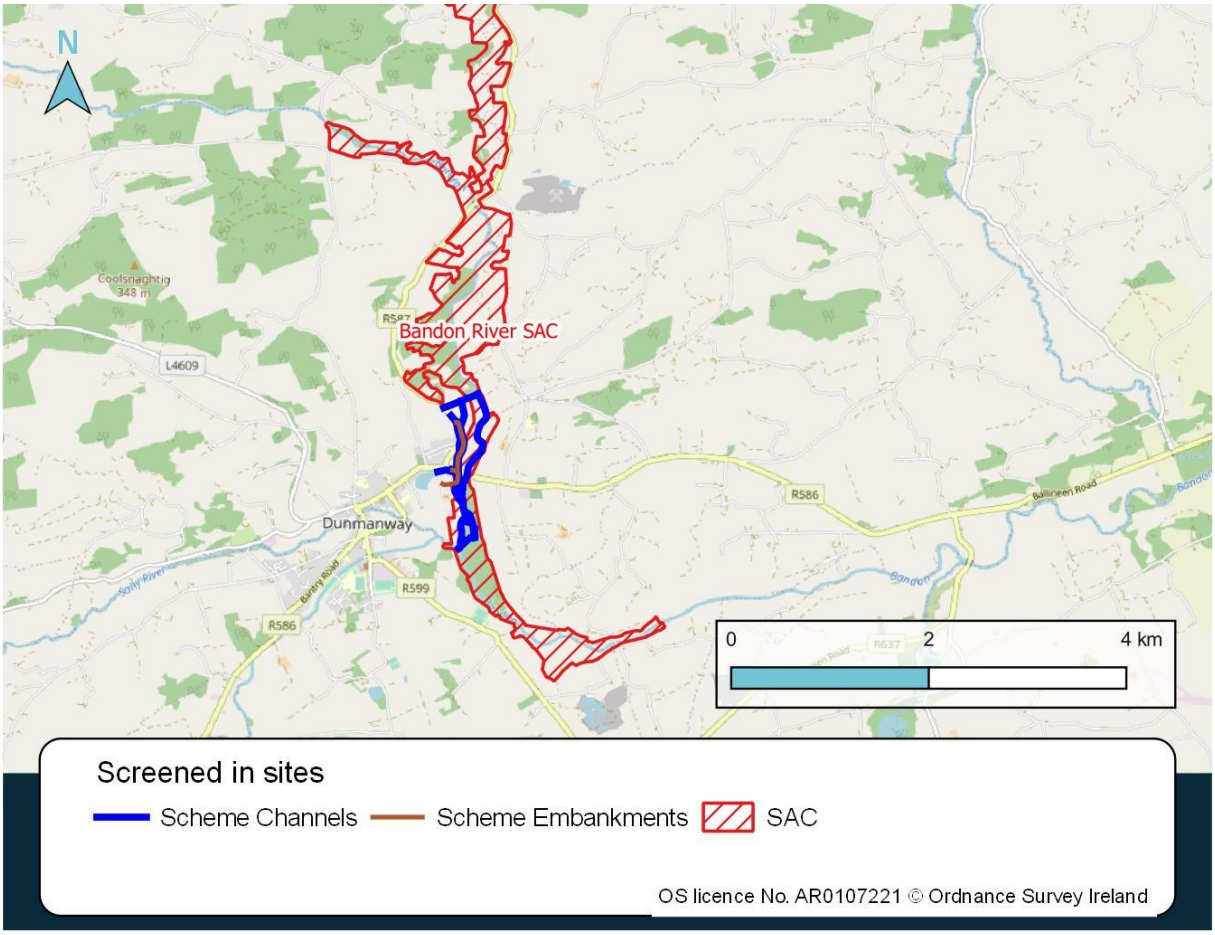

Figure 7-1. Natura 2000 sites screened in

References

BirdWatch Ireland (2018) I-WeBS [online], The Irish Wetland Bird Survey, available: https://birdwatchireland.ie/our-work/surveys-research/research-surveys/irish-wetland-bird-survey/ [accessed 28 Sep 2020].

Brew, T., Gilligan, N. (2019) Environmental Guidance: Drainage Maintenance and Construction. Series of Ecological Assessments on Arterial Drainage Maintenance No 13. Environment Section, Office of Public Works, Trim, Co. Meath, Ireland.

DEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities, available: https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf [accessed 28 Sep 2020].

EPA (2020) EPA Geoportal. Available online at: https://gis.epa.ie/EPAMaps/ [accessed 28 Sep 2020]

European Commission (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, EUR-OP: Luxembourg.

European Commission (2007) Guidance Document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. Clarification of the Concepts of: Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission, available: http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/guidance_art6_4_en.pdf [accessed 31 Aug 2016].

European Commission (2013) Interpretation Manual of European Union Habitats, Version EUR 28, available: http://eunis.eea.europa.eu/references/2435.

NPWS (2013) River Bandon SAC Site Synopsis. Available at: https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY002171.pdf [Accessed 28 September 2022]

National Parks and Wildlife Service (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.

National Parks and Wildlife Service (NPWS) (2019d) River Bandon SAC 002171 Conservation Objectives. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht

NPWS (2022) Appropriate Assessment and the Freshwater Pearl Mussel. Accessed online 1st September 2022. Available at: https://www.npws.ie/research-projects/animal-species/invertebrates/freshwater-pearl-mussel/appropriate-assessment-and

OPR (2021) Appropriate Assessment Screening for Development Management. OPR Practice Note PN01.

Ryan Hanley (2014a) 'Stage 1: Appropriate Assessment Screening Methodology for the maintenance of Arterial Drainage Schemes'.

Ryan Hanley (2014b) 'Source > Pathway > Receptor Chains for Appropriate Assessment'.

Offices at

Dublin
Limerick

Registered Office
24 Grove Island
Corbally
Limerick
Ireland

+353(0)61 345463
info@jbaconsulting.ie
www.jbaconsulting.ie
Follow us:

JBA Consulting Engineers and Scientists Limited

Registration number 444752

JBA Group Ltd is certified to:
ISO 9001:2015
ISO 14001:2015
ISO 27001:2013
ISO 45001:2018

New Civil Engineer TechFest Awards WINNER
New Civil Engineer 100 COMPANIES OF THE YEAR 2016 WINNER
New Civil Engineer 100 COMPANIES OF THE YEAR 2017 RANKED COMPANY
CHAS Accredited Contractor CHAS.co.uk